EMERGING TECHNOLOGIES IN EDUCATION. CONCEIVING AND BUILDING A MICROBLOGGING PLATFORM FOR FORMAL AND INFORMAL LEARNING

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Abstract

Over the last years, the growing ubiquity of Social Media, the emerging mobile technologies and the augmented reality become more deeply integrated into the teaching-learning process and also create new opportunities for reinventing the way in which educational actors both perceive and access learning. Major challenges in academia that involve tremendous development and innovation are blended courses/flipped classrooms integrating Social Media (SM), Open Educational Resources (OER) and Massive Open Online Courses (MOOC).

The main aim of this research work is to explore possible solutions for designing and implementing effective learning environments, founded on new educational technologies, theories and practices. The expected result is to design, implement and evaluate an innovative educational platform, called Cirip, based on microblogging technology. The platform is sought to address emerging technologies and trends in education, to be connected with Social Media networks and applications, and to be used in formal and informal educational contexts. The Design Based Research methodology (DBR) has been used for this thesis research and for the development of the educational platform.

The thesis identifies and analyses new educational technologies, theories and practices; founded on these findings, a conceptual model of Open Learning Environments is introduced.

There are also presented a review of the features, uses and architectures of educational microblogging platforms and the results of two studies on the usages, challenges and policies regarding the integration of emerging technologies and microblogging in Romanian education, for teaching, learning and professional development.

A model of Open Learning Environments based on microblogging technology is proposed, which was validated through designing, implementing and evaluating the Cirip educational microblogging platform, used in a large diversity of formal and informal learning contexts.

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I would like to thank my coordinator, Prof. Dr. Ing. Vladimir-Ioan Creţu, for his long and continuous support.

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Emerging technologies in education. Conceiving and building a microblogging platform for formal and informal learning

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Cuvinte cheie: tehnologii emergente, medii de învățare deschise, design based research, microblogging, blended learning, resurse educationale deschise

Rezumat, Într-o eră dominată de dispozitive și aplicații mobile și colaborative, de lumi virtuale și de realitate augmentată, asistăm la schimbări fundamentale în educație. Se simte din ce în ce mai mult nevoia unei regândiri a procesului de predare-învățare, în concordanță cu aptitudinile și nevoile de învățare ale studenților „crescuți digital", adaptate și încurajând dezvoltarea competențelor. Se impun tot mai mult noile abordări educaționale, cum ar fi învățarea mixtă (blended learning) sau clasele inversate (flipped classrooms) integrând instrumente de media sociale, resursele educaționale deschise (Open Educationale Resources) sau cursurile online masive deschise (Massive Open Online Courses).
În acest context complex, scopul principal al cercetării derulate este acela de a explora soluții noi pentru proiectarea și implementarea de medii eficiente de învățare, fundamentate pe noile tehnologii și practici educaționale.
Rezultatul final al cercetării este proiectarea, implementarea și evaluarea unei platforme educaționale inovative, numită Cirip, bazată pe tehnologia microblogging, care să integreze noi tehnologii și practici educaționale și care să fie utilizată în învățarea formală și informală.
În derularea cercetării doctorale și în dezvoltarea platformei educaționale Cirip este utilizată metodologia cercetării bazate pe proiectare (Design Based Research Methodology).
Pornind de la noile tehnologii și teorii educaționale identificate, se propune un model conceptual de mediu de învățare deschis (Open Learning Environment), care include zece caracteristici, respectiv principii, din categoriile pedagogice, sociale și tehnologice.
Sunt prezentate o analiză a arhitecturilor și caracteristicilor platformelor de microblogging existente, precum și rezultatele a două studii privind integrarea noilor tehnologii și a microbloggingului în învățământul superior din România, ale căror concluzii contribuie la formularea cerințelor platformei educaționale.
Modelul de mediu de învățare deschis propus este mapat pe cerințele unei platforme de microblogging, pentru care se prezintă arhitectura, implementarea și caracteristicile. Mediul Cirip este validat prin studii de caz educaționale formale și informale și este evaluat impactul în învățare și dezvoltare profesională.

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Abbreviations

API: Application Programming Interface
AR: Augmented Reality
DBR: Design Based Research
DC: Digital Curation
FLOSS: Free and Open Source Software
IM: Instant messaging
JSON: JavaScript Object Notation
LA: Learning Analytics
LD: Learning Design
LMS: Learning Management System
MOOC: Massive Open Online Course
msLMS: Mobile Social Learning Management System
OA: Open Access
OEP: Open Educational Practices
OER: Open Educational Resources
OLE: Open Learning Environment
PLE: Personal Learning Environment
PLN: Personal Learning Network
REST: Representational State Transfer
RSS: Really Simple Syndication (Rich Site Summary)
SM: Social Media
sLMS: Social Learning Management System
SWOT: Strengths, weaknesses, opportunities and threats
VLE: Virtual Learning Environment

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Chapter 1. Introduction

The term eLearning was coined by Jay Cross in 1998: “eLearning is learning on Internet Time, the convergence of learning and networks” (Cross, 2004); in the same year SmartForce defined itself as an "e-Learning Company", Cisco spoke about E-Learning, while eLearning (without hyphen) was used in 2000 in the "eLearning - Designing Tomorrow's Education" documents of the European Commission.

My fascinating journey in the eLearning world started at the end of 2000, when I was a participant in the online workshop having as topic online facilitation, organized by University of Maryland University College (UMUC), becoming a certified Online Instructor, and then collaborating with UMUC for 12 years.

On the virtual platform for online courses/workshops I developed in Perl in 2001, two online workshops were run in 2002, being facilitated together with Jane Knight (Hart) from eLearningCentre UK. The workshops gathered more than 150 experts/participants from five continents (Medium Open Online Workshops), the topics proposed to be debated for a week were Online Communities and Methodologies in eLearning (Holotescu and Knight, 2002a; Holotescu and Knight, 2002b). Among the experts who took part in the workshops, there were the well-known founders of the Massive Open Online Courses (MOOC) phenomenon in 2008, Stephen Downes and George Siemens.

Since then, my enthusiastic work in the eLearning and online collaboration domains has included the development of virtual spaces extended with Web2.0 features/ mashups, involvement in many European projects, online/blended courses delivered for universities and institutions, many articles, books and citations. I have been continuously learning together with my students and the peers in my Personal Learning Network, practitioners from worldwide.

This thesis is the result of my research work conducted since 2008, related to open education, Microblogging, Social Media and other connected emerging technologies in education.

1.1. Thesis Context

Over the last years, the growing ubiquity of Social Media, the emerging mobile technologies and the augmented reality become more deeply integrated into the teaching-learning process and also create new opportunities for reinventing the way in which educational actors both perceive and access learning. Major challenges in academia that involve tremendous development and innovation are blended courses/flipped classrooms integrating Social Media (SM), Open Educational Resources (OER) and Massive Open Online Courses (MOOC) (Johnson et al., 2014).

Many articles and studies present innovative approaches in higher education that have been supported by Social Media (Conole and Alevizou, 2010; Hamid, Chang and Kurnia, 2011). Blogs, microblogs, social networks, media sharing sites, social bookmarking, wikis, social aggregation and virtual worlds are used increasingly by students and teachers in the teaching-learning process, in research and in professional development, for communication and collaboration, for sharing resources or for building Personal Learning Environments.

As the classic Learning Management Systems (LMS) are considered too inflexible, offering an instructivist model of education, solutions are studied and

tested for a constructivist approach, centered on student and linking his/her learning needs with pedagogy and technology. There are many projects and implementations of integrated platforms, in which the social functionality becomes available inside the LMS, thus speaking about LMS2.0, social LMS, Open Learning Environments or Social Learning Environments (Crosslin, 2010; Dahrendorf, 2010; Mott, 2010; JISC, 2011).

In spite of effective learning opportunities, the new technologies are embrassed by a limited number of teachers/facilitators and universities, and is still a gap between the implied technological and pedagogical aspects. The main reasons for this gap are represented by:

- rigid policies in formal education related to curricular systems and assessment practices;
- teachers lack of time and interest to explore, understand, evaluate and use new technologies in teaching-learning process (Conole and Culver, 2010);
- usually scenarios for innovative approaches and best cases are presented in a too formal manner using Learning Design languages and tools, which are difficult to understand by the large mass of educators and also there is not a direct link between these scenarios and learning environments (Conole, 2010).

1.2. Thesis Objectives

The *main aim* of our research work is to explore possible solutions for designing and implementing effective learning environments, founded on new learning technologies and theories.

The *expected result* is to design, implement and evaluate an innovative educational platform, called *Cirip*, based on microblogging technology.

The *platform* is sought to address emerging technologies and trends in education, to be connected with Social Media networks and applications, and to be used in formal and informal educational contexts.

Therefore, our research aims are:

1. to identify and to analyse emerging technologies, trends and theories in education;
2. to elicit the needed features of an open learning platform, founded on the identified technologies and theories;
3. to create and validate a model for the development of effective open learning platforms based on microblogging technology.

Selecting microblogging as the base technology for the learning platform, actually the answers and solutions for the following issues and problems represent the thesis objectives:

1. to map the requirements of the microblogging framework onto the features of an open learning platform;
2. to integrate microblogging with other emerging educational technologies;
3. to give students, teachers and practitioners a space to explore and experiment new technologies,
4. to capture and formally represent the new pedagogical approaches and scenarios as learning design objects;
5. to define and implement instruments for learning analytics and for assessing students learning activities;

6. to conceive, to design and to build a microbloging platform for formal and informal learning.

Our findings are presented in this thesis, focused on the implementation, usages and evaluation of the educational microblogging platform, but also on the new open pedagogies approaches, which can be used and extended on other educational environments and contexts.

1.3. Thesis Structure

The thesis is structured in eleven chapters presented below.

This chapter is introductory and sets the subject matter in context.

Chapter two deals with the research approach. It explores the Design Based Research methodology (DBR) and justifies its use for this thesis research and for the development of the educational platform. The introductive part of each of the next chapters makes the connections with the DBR phases, explaining the place of their topics in the DBR iterative process.

Chapter three contains the literature review that identifies and analyses the emerging technologies, trends and theories in education. It presents an original classification of Social Media applications and platforms. Also we elicit here the needed features and a conceptual model of open learning environments, based on the identified technologies and theories.

An extensive literature review on Microblogging, one of the top emerging technologies of the moment, and its oportunities in education can be found in Chapter four.

An image on how new educational technologies are used in Romanian universities, as a result of a study we have carried out, is depicted in Chapter five.

In Chapter six, the conclusions of the two literature reviews and of the study mentioned above will serve to define the requirements of an educational microblogging platform mapped onto the features of the model of open learning environment defined in Chapter three.

Chapter seven reports on the solutions found for the architecture and implementation of the Cirip educational microblogging platform. Also its API, mashups and plugins are described here.

Chapter eight focuses on the implementation and usages of Cirip as an Open Learning Environment (Mobile Social Learning Management System - msLMS), addressing:

- Learning Management features,
- Mobile Learning features,
- how Social Objects are integrated as (small) Open Educational Resources in the platform flowstream,
- how Learning Scenarios can be specified as Learning Design objects, and also
- the facilities for student Assessment.

During the last seven years the Cirip platform has being used in many educational projects based on Open Educational Practices, the most interesting being exposed in Chapter nine:

- Online Courses and Courses Enhancement in high schools and universities,
- Learning from the Stream,
- MOOCs integration in Blended Courses,
- Teacher Training, and also

- Developing Personal Learning Environments.

Each case study discusses the specific features offered by other microblogging platforms for that particular usage and also the advantages and possible drawbacks of Cirip. Also each case study represents an iteration and an improvement of the environment developed using the DBR approach.

The platform and each case study were evaluated and validated by students and teachers who have used the microblogging platform during courses, for research and for personal development, the results being the subject of the two studies presented in Chapter ten.

The final conclusions are drawn in Chapter eleven, together with the presentation of the original contributions and future developments. The chapter contains also the dissemination and awards/recognitions of the doctoral program results.

A large list of actual references studied for this thesis, our publications, projects and citations can be found in this work too.

Chapter 2. Design Based Research Methodology

2.1. Introduction

The Cirip educational microblogging platform was developed using the Design Based Research (DBR) methodology approach. This methodology is presented in this chapter, together with its adaptation for our platform development.

2.2. Design Based Research Methodology Definition

The Design Based Research (DBR) methodology was defined and developed since the middle of the 1990s, as a response to the need for a research approach that addresses complex problems in educational practice, for which no clear guidelines for solution are available (Barab, 2006). In the fields of educational technologies and learning sciences, becoming more complex with the plethora of new technologies, the research paradigms that examine learning processes within laboratory settings would produce incomplete understanding of their relevance in more naturalistic settings (Figure 2.2). In this context, DBR was defined such as researchers would systematically and interatively adjust various aspects of the designed environment so that each change served as a type of experimentation that allowed the researchers to test and generate theory in naturalistic settings, incorporating strong involvement of the end user (Barab and Squire, 2004; Reimann, 2013).

The DBR is perceived as „the systematic study of designing, developing and evaluating educational interventions - such as programs, teaching-learning strategies and materials, products and systems – as solutions to such problems, which also aims at advancing our knowledge about the characteristics of these interventions and the processes to design and develop them" (Plomp and Nieveen, 2007). DBR requires providing local warrants for the effectiveness of the design work while simultaneously attempting to contribute to a larger body of theory (Barab and Squire, 2004).

Increasingly applied in educational software projects, Design Based Research (DBR) „is used to study learning in environments which are designed and systematically changed by the researcher" (Barab, 2006), this way three deeply intertwined goals can be identified: research, design, and pedagogical practice (Joseph, 2004).

Reimann (2013) shows that DBR's main focus is on innovations in teaching and learning that pertain; due to the large usage of the new technologies and Social Media in education, many DBR studies have had an additional focus on technological innovation.

DBR requires a collaboration of a multi-disciplinary team because the design/development and the research aspects of theories of learning, including teachers' learning are of equal importance (Reimann, 2013).

The DBR methodology has the following characteristics (Barab and Squire, 2004; Barab, 2006):

- *object of the close study*: (usually) a single learning environment which passes through successive iterations and is used in different contexts;

- *goals*: to develop new pedagogical theories, artifacts and practices that can be generalized and used in other learning contexts/environments; to generate new theories and frameworks for conceptualizing learning, instruction, design processes, and educational reform;
- *phases*:
    - the learning environment is designed and developed by researchers to solve a local/particular identified problem, bringing innovations inspired by a theoretical study/research; even if the environment aims at solving a local problem and proving its usefulness/effectiveness, the design work follows the goal of new theory generation;
    - then successive phases in an iterative cycle/on-going design process allowing the generation and advancement of the new theory:
        - improvement/development of new facilities;
        - tests piloted in real-world educational settings, which involve informal learning, collaboration among learners, different resources, etc.;
        - evaluation implying social interactions with participants for sharing ideas, and for bringing their expertise into producing and analysing the design.

The DBR process has different representations (Plomp and Nieveen, 2007). Figure 2.1 specifies the way Reeves (2006) depicted the four connected phases:

- analysis,
- development of solutions,
- iterative cycles of testing and refining solutions, and
- reflection to produce design principles.

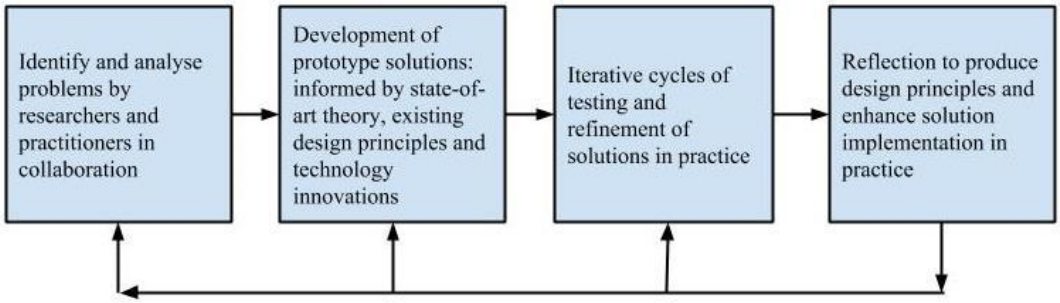


Figure 2.1. DBR: Refinement of problems, solutions, methods and design principles (Reeves, 2006)

Figure 2.2 illustrates the predictive research studies that have beeing used in educational technology research for decades (Herrington et al., 2007). This way the differences between the two approaches can be noted: a strong connection and collaboration between researchers and practitioners for DBR, while for the predictive research they work separately in different phases; also the end users are implied in the iterative cycles used by DRB, while for the predictive research they test only the final product.

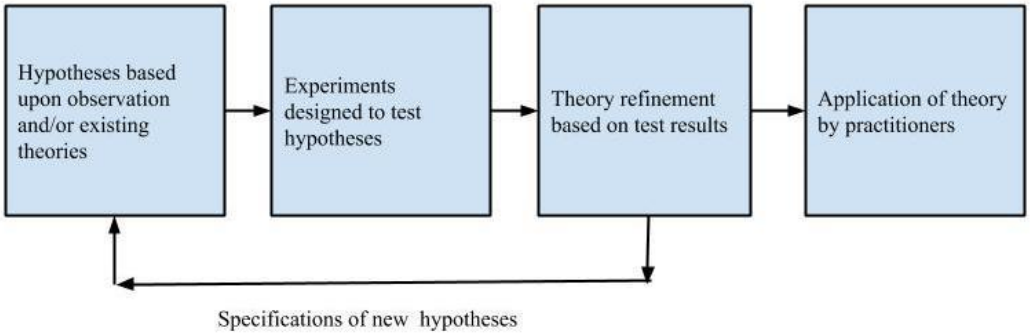


Figure 2.2. Predictive Research (Herrington et al., 2007)

DRB has three theoretical influences: experimental educational psychology, design research and participatory software development methods (Reimann, 2013). DBR is a common label for related research approaches, such as design studies, design experiments, design research, developmental research, formative research, engineering research or educational design research (Plomp and Nieveen, 2007; McKenney and Reeves, 2012).

There are many similarities between Design Based Research (DBR) and Agile Software Development, both paradigms being defined before the 2000s (Burn, 2013; Creţu, 2010):

- are flexible and responsive
- imply iterative and incremental development
- involve users / costumers
- have rapid and flexible response to change
- working environment / software is delivered and used in all phases of the project.

2.3. Design Based Research Projects

There are many articles and studies that describe in sufficient detail how DBR is done in practice (Jacobson and Reimann, 2010; Luckin et al., 2013). In Table 2.1 four projects developed using DBR are presented. There are specified both the local impact of the work as well as the resultant theoretical contributions.

Table 2.1. DBR Projects in terms of the designed artifact/environment and resultant theory

Projects / Research study	Local impact	Theoretical work
Cloudworks: a social network for finding, sharing and discussing learning and teaching ideas and designs (Conole and Culver, 2010)	An active social network for teachers / practitioners continuing professional development, to explore and experiment, and provide them with scaffolds, support and examples of how technologies have been used to good effect	Richer understanding of the challenges and demonstrating how Social Media can be used in finding, sharing and discussing learning and teaching ideas and designs. Design patterns

	in a range of different educational contexts. Clouds are core social objects.	based on the notions of social objects and the concept of design for sociality.
Implementation of an online professional development course for higher education practitioners based on authentic learning principles (Parker et al., 2013)	Provide university professionals with the opportunity to experience online learning from a student perspective, learn how to use authentic learning guidelines to design their own courses, explore how new technologies could be used to support student learning, and use social media to collaborate with their peers.	Providing possible solutions for designing and implementing effective online higher education courses, based on a social constructivist model of learning.
Build a reformed Software Engineering subtrack within Computer Science curriculum (Luukkainen et al., 2012)	Completely rethink the contents, structures and pedagogical practices of the existing courses, introducing up-to-date industrial best practices. Include new courses in SE curriculum. Increase students learning, programming and team working skills, and readiness to start working as a "junior software developer" in the software engineering industry.	Demonstrating that a renewed SE curriculum demands new student-centered teaching methods, renewed ways of presenting old content and new ways of organizing administration.
CLUE (convergent learning in a ubiquitous environment) Framework: a learning environment for connecting learners' experiences in real informal settings with formal school settings (Heo et al., 2013)	Student learning and attitudinal gains using informal experiences. Building learning communities active inside and outside classrooms. Plan learning process and activities in class that integrate informal experiences.	Demonstrating how ubiquitous computing technologies can assist the integration of informal experiences in formal learning by capturing individuals' feelings and thoughts in the real world and connecting to systematic school learning. Teachers also need to be aware of the importance of informal experiences in students' lives and the ways to combine them into the school curriculum.

2.4. Thesis Design Based Research Phases

The main aim of our research work was to design and implement an innovative educational microblogging platform, called Cirip, which can be used for formal and informal learning. The framework development used the Design Based Research methodology (DBR), presented before. The four connected phases of DBR defined by Reeves (2006) (Figure 2.1) were adapted for the educational microblogging platform development (Figure 2.3):

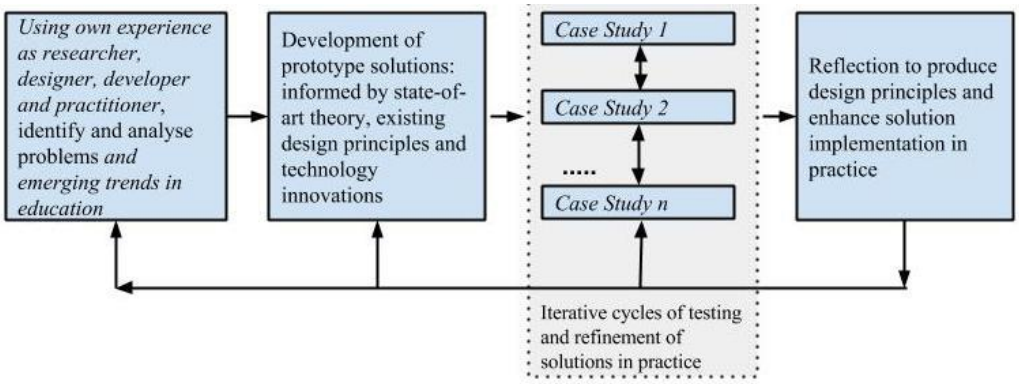


Figure 2.3. Design Based Research phases for Cirip development

The DBR phases are summarized below and will be presented in the next chapters:

Phase 1:

One of the thesis research objectives was to extensively review the literature on Social Media and Microblogging (together with variants for architecture implementation), and to identify the connected emerging technologies/trends, and their opportunities in education – *Chapters three and four*.

Another important scope was to study how the Romanian educational actors integrate Social Media in teaching/learning process, in research and in personal development, this way articulating the emerging technologies, also their advantages and disadvantages – *Chapter five*.

Phase 2:

In an iterative cycle, the results and conclusions of the first phase were used to define the requirements of the educational microblogging platform – *Chapter six.*

For the iterative and incremental prototypes of the platform the architecture, implementation and features are presented in *Chapters seven and eight*.

Phase 3:

The platform is used in many formal and informal learning settings, presented in *Chapter nine*, implying an important number of courses, students and teaching staff, at different levels of educational levels.

Phase 4:

The platform usefulness and impact in different educational contexts are evaluated, the conclusions being used for the platform iterative development and improvement – *Chapter ten*.

In developing the platform we have used our intensive, enthusiastic and long experience in working with and developing educational platforms, as a

researcher, developer and also as a designer and facilitator of online and blended courses.

In order to evaluate and improve the platform we have worked in a close collaboration with a small multidisciplinary team, consisting of teachers and practitioners in Computer Science and Social Sciences, who appear as co-authors of the published studies (listed in *Appendix*).

2.5. Conclusions

The chapter focuses on the definition and phases of the Design Based Research (DBR) methodology, presenting its increasing application in educational software projects with pedagogical and technological innovations, also its similarities with Agile Software Development.

The DBR methodology adaptation for Cirip development is presented too (Figure 2.3). The introductive part of each of the next chapters will make the connections with the DBR phases.

Chapter 3. Emerging Technologies and new Trends in Education. State of the Art

3.1. Introduction

This chapter is a literature review of Emerging Technologies and new Trends in Education, being part of the first phase of the Design Based Research approach (Figure 2.3).

It defines Social Media, presenting an original classification of Social Media applications and platforms, and identifies and describes the connected emerging technologies and trends, also their oportunities in education.

To be able to design the microblogging platform it was necessary to understand the challenges brought to education by Social Media and emerging technologies, and the models of the new learning environments. So we propose here a conceptual model for open learning environments, founded on the identified technologies and theories.

3.2. The Social Media Landscape

In this era of fundamental changes in education brought by virtual worlds and augmented reality, dominated by mobile devices and applications, in order for Learning2.0 to occur, it is necessary to rethink the academic work environments based on Web2.0 technologies, in accordance with the (pedagogical) learning needs of students. In this context we discuss some of the challenges which occur in integrating Social Media in the teaching / learning process, and the ways to respond to them via pedagogical approaches that help students transform the Social Media universe in reflective practice.

In a so-called „ubiquitous network society", it seems only natural that the technologies supporting the world's largest network of networks become one of the main topics for reflection and educational practice, as well as a focus of graduate and/or postgraduate studies. Nowadays educators from all over the world are spending more and more time within this new form of social reality.

The current debates on whether or not to introduce social web technologies into higher education are useful, but ultimately worthless without experience, creativity and innovation – the desire to think of the educational process in completely new terms. Even the new web is a source of intellectual optimism, a fact of life, and an increasingly fact of learning, this does not mean that the things we have learned so far need to be buried and forgotten. We need to remember that we are at the beginning of a new era and, inevitably, at the end of another one – an era of change, the *Social Web Era*.

3.2.1. Defining Social Media

Social Media is a generic term covering a large range of online platforms and applications which allow users to communicate, collaborate, interact and share data. Thus, Social Media encompass easily-accessible web instruments that individuals

can use in order to talk about, participate in, create, recommend and take advantage of information, in addition to providing online reactions to everything that is happening around them.

There are many definitions of Social Media, and they are evolving in time, as Brian Solis (2010) underlined it in his post „Defining Social Media: 2006 – 2010".

According to Kaplan and Haenlein (2010) Social Media is „a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user generated content", the authors signaling the confusion of the terms such as Social Media, Web2.0 and user generated content among managers and academic researchers. In her "Social Learning Handbook", Jane Hart (2011) notes: "Social technologies, aka Social Media, are a new breed of technologies that have emerged over the last few years and have changes the face of the Web." Social Media is about transforming monologue into dialogue, about free access to all types of information, about transforming internet users from mere readers to creators of content, about interacting in the online world so as to form new personal or business relationships.

A similar approach has Amy Campbell (2010a) who enumerates as defining characteristics of Social Media the following three: the majority of content is user generated, a high degree of participation/interaction between users, and easily integration with other sites. Anthony J. Bradley (2010) has identified six core principles that set Social Media apart from other forms of communication and collaboration: participation, collective, transparency, independence, persistence, and emergence. Kaplan and Haenlein (2010) suggest that Social Media tools can be organized into six major categories by applying a set of theories in the field of media research (social presence, media richness) and social processes (self-presentation, self-disclosure): blogs, social networking sites, virtual social worlds, collaborative projects, content communities and virtual games worlds.

Conole (2013) has defined five characteristics of Social Media:

- Peer critiquing: the ability to comment in an open way on other people's online work/content, the feedback representing a mean to validate and improve that work;
- User-generated content: web is no longer a passive or read only platform, but an active, participatory, productive media;
- Collective aggregation: social (collaborative) bookmarking, tag clouds and associated visualisation tools, tagging, RSS feeds and embedding code, all enable collective aggregation and folksonomies to occur;
- Community formation: the connectivity and rich communicative channels provide an environment for supporting a large spectrum of communities: from loosely bound spaces through learning communities and communities of practice;
- Digital personas: our activities on different platforms give a collective picture of how we are viewed by others and build online portfolios.

We encounter Social Media in many different forms, including internet forums, blogs, microblogs, social networks, media sharing sites, social bookmarking and tagging systems, wikis, social aggregation, virtual worlds, social games and so many other (social) online artefacts. Nevertheless Social Media remain the communication and collaboration media that have registered the most important growth during the past years. For instance, Facebook targets an educated, career-oriented, blog-reading audience, whose members are interested in being part of communities and sharing their experiences, while Twitter draws especially opinion leaders, who run blogs and are passionate about networking, who are always

connected to the latest news and trends and directed towards professional development and personal accomplishments. We believe that it is important to get to know the specific characteristics of the audience of these social platforms, the applications and tools provided, with the aim of drawing correct usage and promotion principles that are applicable in the academic environment.

3.2.2. Web2.0

Social Media has been evolving in a strong interconnection with the Web2.0 technologies, a term defined by Tim O'Reilly in his fundamental article „What Is Web 2.0 - Design Patterns and Business Models for the Next Generation of Software" (O'Reilly, 2005).

The Web 2.0 could be briefly described by the following characteristics:

- it includes a wide range of applications and services that use the Web as a unitary and structured communication platform;
- it is built on an architecture that encourages the active participation of users;
- it allows an easy interaction between users with similar interests;
- it offers users the possibility to create, syndicate, tag content, share it with others, so it allows a stronger interactivity;
- it uses the power of internet users' communities;
- points to a change in paradigm with reference to the Web.

3.2.3. Social Objects

Jyri Engeström[1] (2005), co-developer of the Jaiku[2] microblogging platform (acquired by Google in 2007) and then responsible for Google mobile applications, has launched a theory stating that, in most cases, people base their relations on certain objects, which he named "social objects". These can be physical, such as "location", and semi-physical (such as „attention") or even conceptual, such as "on-line presence". According to Engeström, objects become the center of any social relation and the nucleus/fundamental notions of a strong social network, for which he defends the approach called "object centered sociality". "*The social networking services that really work are the ones that are built around objects.*":

- photos are objects of sociality for Flickr,
- URLs are objects on del.icio.us,
- events are objects focused on Upcoming.org,
- books are objects on Amazon,
- research papers are objects of focus on Academia.edu,
- music is the focal object on MySpace, and
- annotating places are social objects for Foursquare, to mention only a few successful social networks.

Engeström (2005) also underlines that: "*Approaching sociality as object-centered is to suggest that when it becomes easy to create digital instances of the object, the online services for networking on, through, and around that object will emerge too.*"

1 Jyri Engeström's profile at CrunchBase http://www.crunchbase.com/person/jyri-engestrom
2 Jaiku (this name because the posts on Jaiku resemble Japanese haiku), purchased by Google in 2007, was shut down in January 2012; Jaiku had 15000 users; Google published Jaiku code at https://code.google.com/p/jaikuengine/.

Following the experience with the innovative Jaiku, having as "*social objects to go*" attention, location and presence, Engeström (2007) has defined the *five key principles* for building a service around social objects:

- define your object
- define your verbs
- make the objects sharable
- turn invitations into gifts
- charge the publishers, not the spectators.

In such a network built around social objects, people will connect to objects, objects to people, objects to objects, and people to people (becoming friends through a social object) (Betta, 2007).

3.2.4. A Typology of Social Media

In Table 3.1 and Table 3.2 we propose two large categories of Social Media, depending on the social objects they are build around: for content sharing and for communication /collaboration / location-based. For each subcategory the most representative worldwide and Romanian platforms and applications are listed. The typology covers the current Social Media landscape (Solis and JESS3, 2010) and educational tops (Hart, 2014), and is a result of our research and work with these platforms during courses and workshops.

Table 3.1. Social Media networks and applications for content sharing

Blog (Blogger, WordPress, weblog.ro)
Miniblog (Tumblr.com, Posterous.com)
Microblog (Twitter.com, Cirip.ro, Plurk.com, Edmodo.com)
General Social Networks (Facebook.com, Plus.Google.com, MySpace.com)
Professional Social Networks (LinkedIn.com, Xing.com, Academia.edu, Researchgate.net, Mendeley.com, Classroom.Google.com)
Social Bookmarking/Curation (Delicious.com, Diigo.com, Pinterest.com)
Video sharing (Youtube.com, Vimeo.com, TED.com, TeacherTube.com, Trilulilu.ro, MyVideo.ro)
Image sharing (Flickr.com, Picasa.Google.com, deviantART.com, Instagram.com)
Audio/Podcasting sharing (Blip.fm, SoundCloud.com)
Code sharing (Ideone.com, Pastebin.com)
Presentation sharing (Slideshare.net, Authorstream.com, Prezi.com)
Document/Books sharing (Scribd.com, DocStoc.com, Drive.Google.com, Books.Google.com)
Mindmaps (Mindomo.com, Mindmeister.com, Spicynodes.org)
Screencasting (Screenr.com, ScreenJelly.com, ScreenCastle.com)
Livestreaming (Qik.com, UStream.com)
Feeds Monitoring (Reader.Google.com, Bloglines.com, Nuzzel.com)
Wiki (Wikispaces.com, MediaWiki.org, Wikia.com, PBWorks.com)
Digital storytelling (Voicethread.com, Glogster.com, Capzles.com, Notaland.com, Storybird.com, Storify.com, Photopeach.com, Projeqt.com, Padlet.com, Bibblio.com)

Table 3.2. Social Media for communication/collaboration/location-based
Groups (Groups.Google.com, Groups.Yahoo.com, Ning.com, Meetup.com)
Forums/Spaces for discussions (phpBB.net, Quora.com, Disqus.com)
Location-based (Foursquare.com, Yelp.com, Zvents.com)
Augmented reality (Layar.com, Wikitude.com, Zooburst.com)
Virtual worlds/Social Games (Secondlife.com, Playdom.com, OpenSimulator.org)
Instant messaging (YM, GTalk, Jabber, Skype)

These classifications have been used to assess how the Romanian educational actors use Social Media and new emerging technologies in their professional activities, the results being presented in Chapter 5. Also the characteristics of these platforms/applications are compared in Chapter 6 in order to define the requirements of Cirip, also to decide which Social Media platforms to be connected with it.

3.2.5. Microblogging

Microblogging is a term in common use since 2006, when Twitter and Jaiku were launched, being a form of Social Media, recognized as Real-Time Web Publishing (Winer, 2009), which has won an impressive audience acceptance and surprisingly changed online expression and interaction for millions of users.

In this context, microblogging is a form/an extension of real-time blogging, which creates real-time interactions between users by means of various devices, technologies and applications.

3.3. Trends and technologies connected with Social Media

In order to identify the emerging educational trends and technologies connected with Social Media we have studied the reports produced by New Media Consortium (NMC) Horizon Project (HP), an initiative launched in 2002, that charts the landscape of emerging technologies for teaching, learning, research and creative inquiry. The Horizon Project reports, published annually in collaboration with the EDUCAUSE Learning Initiative and released with a Creative Commons license (attribution-only), constitute expert research and analysis used by educators, practitioners and leaders across the world to innovate their activities and institutions.

Table 3.3 depicts the trends in using technology in education, as resulting from the HP reports published over the last eight years, between 2008-2015. The emerging technologies are classified according to the adoption time in three categories: one year or less, two to three years and four to five years (NMC, 2008-2014; NMC, 2015). Between paranthesis, for each of the three categories, there are presented also two technologies published in the short list of the draft report for 2015 (NMC, 2015a).

Table 3.3. Emerging technologies in education as reported by the Horizon Project 2008-2015

HP Report	One Year or Less	Two to Three Years	Four to Five Years
2008	- Grassroots Video - Collaboration Webs	- Mobile Broadband - Data Mashups	- Collective Inteligence - Social Operating Systems
2009	*- Mobiles* - Cloud Computing	- Geo- Everything - The Personal Web	- Semantic Aware Applications - Smart Objects
2010	*- Mobile Computing* *- Open Content*	- Electronic Books *- Simple Augmented Reality*	- Gesture-Based Computing *- Visual Data Analysis*
2011	- Electronic Books *- Mobiles*	*- Augmented Reality* - Game-Based Learning	- Game-Based Learning *- Learning Analytics*
2012	*- Mobile Applications* - Tablet Computing	- Gesture-Based Computing *- Learning Analytics*	- Gesture-Based Computing - Internet of Things
2013	*- Massively Open Online Courses* - Tablet Computing	- Games and Gamification *- Learning Analytics*	- 3D Printing - Wearable Technology
2014	*- Flipped Classroom* *- Learning Analytics*	- 3D Printing - Games and Gamification	- Quantified Self - Virtual Assistants
2015	- Bring Your Own Device (BYOD) *- Flipped Classroom* *(- Learning Analytics)* *(-Mobile Applications)*	- Makerspaces - Wearable Technology (- Collaborative Environments) (- Games and Gamification)	- Adaptive Learning Technologies - The Internet of Things (- Wireless Power) (- Flexible Displays)

We have selected the following emerging technologies that have been expected for adoption between 2008-2015 (in italics in Table 3.3):

- *Mobile Applications* (the term is similar or close/connected to Mobile Learning, Tablet Computing, Bring Your Own Device and Electronic Books)
- *Open Content*
- *Augmented Reality*
- *Learning Analytics* (as part of the *Visual Data Analysis* trend in HR2010)
- *Massively Open Online Courses*
- *Flipped Classroom.*

They are presented in this chapter, together with other trends identified in literature.

3.3.1. eLearning2.0/Social Learning/Informal Learning

In education the uses of Web 2.0 technologies marked a shift from eLearning to eLearning2.0, a term coined by Stephen Downes (Downes, 2005).

eLeaning2.0 implies:

- informal / social learning is integrated in formal learning;
- during courses, a learning community is built which includes not only students and facilitators, but also peers worldwide;
- students build their own ePortfolios and Personal Learning Environments;
- the Learning Management Systems (LMS) are enlarged by using Free and Open Source Software (FLOSS), Open Educational Resources (OER), collaborative content and interactions on Web2.0 platforms/applications, such as blogs, wikis, RSS, podcasts.

In pedagogy, Social Learning means learning through social interaction with peers (Conole, 2013). With the growth of Social Media, Social Learning is understood as learning with Social Media, through communication and collaboration, with peer learners, and possible with facilitators (Hart, 2011). Social Media are powerful enabling tools, when used appropriate; otherwise, forcing people to use Social Media in courses "in traditional command-and-control approaches", without understanding how to organize learning activities in a natural way, could lead to *Fauxial Learning* (Hart, 2014).

Social Learning means also new forms of learning, detailed in (Conole and Alevizou, 2010):

- inquiry-based and exploratory learning;
- new forms of communication and collaboration;
- new forms of creativity, co-creation and production;
- richer contextualization of learning.

Informal learning happens voluntarily in minimally structured situations, without pre-set learning resources and pre-designated teachers (Clough et al., 2008), it is a self-directed, serendipitous, curiosity-based learning (NMC, 2015). That is, informal learning is likely to happen in a highly personalized manner based on learners' particular needs, interests, and past experiences. The claim that people learn through understanding and solving real-world problems in everyday lives shows that informal learning is the most natural way of learning. The NMC Horizon Report Project (2015) shows that blending formal and informal learning represents a solvable challenge for academia, that "can create an environment that fosters experimentation, curiosity, and above all, creativity". Usually the terms eLearning2.0, Social Learning and Informal Learning are considered as synonyms.

3.3.2. Open Educational Resources

The proliferation of Web2.0 technologies and the new skills and knowledge gained by students, teachers, practitioners in creating and using Social Media resources determined the acceleration of the movement related to open access and Open Educational Resources (OERs). The term OERs was adopted at the UNESCO Forum in 2002, when the impact of the Open Courseware projects on higher education was analyzed, and officially renamed in April 2011 as „Freely/Openly Enabled Resources Supporting Training, Education, and Research" (FOERSTER). The main reason was that their use in higher education „has not yet reached the critical threshold" (OPAL Report, 2011) and has to be highlighted in all of the areas where they are transforming education, as research and training.

Open Educational Resources mean any teaching, learning and research materials that are freely and openly available for use, to be shared, combined, adapted or expanded by teachers, educators, students and independent learners, without an accompanying need to pay royalties or license fees (OECD, 2007;

Butcher et al., 2011; UNESCO, 2011).

The Open Educational Resources include (Downes, 2012a; Holotescu, 2007):

- digital assets as materials (content) for teaching and learning: open courseware and open content projects, free courses, learning objects directories, educational magazines, educational resources created and distributed on Social Media platforms;
- visiting lecturers and experts, twinning arrangements (international exchanges of students and academic staff), also inter-institutional programmes developed collaboratively;
- open source software/open applications/platforms - for the development, use, reuse, research, organization and access to the resources; these also include virtual environments, learning communities, Web2.0 technologies/applications/tools;
- intellectual property licenses promoting the open publication of the materials, design principles and good practices, the localization of the content.

Although the „Open/Free" culture is in full development, it has become extremely attractive for educational institutions to exploit it as well. Nevertheless, the higher education space is facing the following dilemma: „to open"/ to share or „to close"/ not to share access to information and ideas? (Andersen, 2010). Should we facilitate and encourage access to resources or should we limit this access so as to protect legitimate interests, property rights, patents, the right to intimacy, the intellectual property? Thus, an increasing number of educational actors are embracing the idea of an OpenCourseWare / Open Knowledge / Open Faculty – in a generic term *Open Education*, which allows access to all their course materials under a copyleft license (generally Creative Commons Attribution, Non-commercial, Share alike). The latter offers the freedom to use, share and exchange content for non-commercial purposes, provided that the original author receives due recognition, while all derived materials must be used under the same license.

Conole (2013) offers a broad perspective of the notion of "*openness*", covering each major phase of the academic life cycle, namely, *design, delivery, evaluation* and *research*.; a list of the new initiatives in the OER movement can be also consulted (Stacey, 2011).

„Open digital faculty do more than just share and participate in open resources; they transfer their approaches to the teaching space. Learning becomes a shared activity in which the students also collaborate and participate in shaping the course activities. Student participation takes place in open environments where students might tweet what they learn, share insights on a group blog, create their own website of resources, or participate in a class wiki" (Andersen, 2010).

Through the years a variety of institutions, organizations or foundations like UNESCO, OECD or the European Union were preoccupied to launch (providing financial support, too) various initiatives across the world for programs and projects related to OER. Some of the current initiatives which act as driving forces for transforming education and learning at all levels are: Open Education Europe (Opening Up Education Through New Technologies), SCALE CCR (Up-Scaling Creative Classrooms in Europe), OEREU (Open Education Resources and Practices in Europe) and POERUP (Policies for OER Uptake).

The new European *Rethinking Education strategy* specifies that: "Technology, in particular the internet, must be fully exploited. Schools, universities and vocational and training institutions must increase access to education via open educational resources." (EC, 2012).

We appreciate that Romania is active in the OER movement mainly through OER and OEP initiatives by institutions/groups and engaged individuals, and through specific projects or programmes, on the following axes/directions (Holotescu, 2012; Holotescu et al., 2014b):

- trainings/courses related to OER and OEP organized for both pre-university and university sectors;
- proposals at governmental level related to OER and Web2.0, that can become driving forces; more for the pre-university level – but not yet in formal policies: Knowledge based Economy Project[3] and the Government Programme for 2013-2016[4]: Ministry of Communication and Ministry of Education will collaborate to support the innovative integration of Web2.0 and Open Educational Resources in education;
- national events related to open resources produced by pre-university teachers; national guides were published too;
- directories with open resources (more numerous for pre-university level);
- projects in development for MOOCs at university level and for continuing education;
- strong communities/events for open source, open access, open data, open licences (the Creative Commons Romania version[5] was launched in September 2, 2008).

3.3.3. Learning Design

According to Stutzman (2009), Learning Design (LD) aims to enable reflection, refinement, change and communication by focusing on forms of representation, notation and documentation, also to support teachers in making pedagogically informed, in better use of educational resources (OER) and collaborative technologies (Social Media). Learning Design and Learning Analytics work together: a condition for successful learning and teaching is to evaluate and improve learning design based on learning analytics. The scope of LD is to raise the quality of the learning experience, learning outcomes and learner support, proving a "coherent sequence of media, technologies and pedagogies" (Sharples et al., 2014).

There are some notable projects which mark the Learning Design domain: variants of EML, the Educational Modelling Language developed by the Valkenburg Group, IMS-LD standard, JISC Design for Learning Program, modelling tools such as LAMS, Reload, CopperCore, CompendiumLD, etc (Conole and Alevizou, 2010). We should also mention Cloudworks, a social network focused strictly on LD (Conole and Culver, 2009), gathering a community of practice that discuss and share resources, ideas and scenarios for integrating new technologies in education, in an informal way.

3.3.4. Social Learning Management Systems

One area where Social Media is having an important impact is the development of Learning Management Systems (LMSs). LMSs have dominated the academia landscape since the middle of 90s, almost all universities having an institutional LMS implementation, which connects the user to university resources,

3 Knowledge based Economy Project http://www.ecomunitate.ro/en/proiect
4 Government Programme for 2013-2016, adopted in December 2012, http://gov.ro/upload/articles/118981/program-de-guvernare-2013-2016.pdf
5 http://wiki.creativecommons.org/Romania

regulations, help, and educational content such as modules and assessment.

Nowadays, when students and teachers use Social Media platforms and Web 2.0 tools for creating and sharing content, for communication and collaboration, "the LMS may be perceived as inflexible and 'cookie-cutter' in its method of organizing instruction, falling behind in its ability to support the trend toward personalized learning environments" (Ingerman and Yang, 2010) or like "a slow-moving cruise ship that locked passengers in their cabins" (Stein, 2014).

Three important drawbacks of the institutional LMS are stated by Mott (2010) and Mott and Wiley (2009):

- LMSs are generally organized around academic semesters, this way the learning process is disrupted and the learning communities don't continue to exist after the course end;
- LMSs are teacher-centric, teachers being those who create courses, upload content, start discussion forums and form study groups; students initiative and self learning decisions are limited; LMSs are used more for "downloading learning" - modules than for collaborative work;
- Courses developed and delivered via the LMS are walled gardens, limited to the students officially enrolled: content/sharing/communication/collaboration remain in the private space of the course.

Groom and Lamb (2014) outline five arguments against the Learning Management Systems:

- Systems: Usually educational institutions view "learning as a technological problem, one that requires a 'system' to 'manage' it". They should support "learning enhancement environments" not "learning managements systems";
- Silos: In spite of the current hype around open education, most of LMSs don't provide "capacities to publish to and interact with the wider web and public", restricting "online teaching and learning activity to these closed systems". Courses are like silos which can not be referred by students after the course end, thus the lifelong learning is not promoted and also the university mission of promoting enlightenment and critical inquiry in society is missed.
- Missed Opportunities: Students are supposed to spend hours in virtual spaces that don't equip them with new digital skills and practice instead of being guided into an "information age of immense complexity, promise, and uncertainty" in a spirit of critical inquiry. "They are in a system; they are being managed".
- Costs: There are important costs associated with supporting LMSs; the budget and staff time might be directed toward alternative solutions such as free Social Media applications and platforms, open-source and user-driven innovation.
- Confidence: Most LMSs are found inflexible by both students and teachers comparing with Social Media platforms and applications and many time educational actors loss the confidence to experiment beyond the "system".

Weller (2014) concludes that "rather than being a stepping stone to further elearning experimentation, the LMS became an end point in itself".

Personal Learning Environments (PLE) and social LMS (LMS integrating social networks/collaboration) are now taken in account by many universities which search solutions for the coexistence and interoperability between LMSs and open educational technologies (Hill, 2014).

3.3.5. Personal Learning Environments

The term "Personal Learning Environment" (PLE) was coined in 2004 by JISC and Scott Wilson, meaning the integration of Social Media around the learner who sets the own learning goals, manages the learning content and communicates, shares and learns with others in the process of learning (JISC, 2004; Wilson, 2005).

Thus social interactions among participants could support the learning process in social environments specially created or utilizing the functionality of existing social sites and software.

Another term "Personal Learning Network" (PLN) has recently emerged to describe "the sum of all social capital and connections that result in the development and facilitation of a personal learning environment" (Couros, 2010).

Obviously, the social interactions of an individual in a social oriented online environment, in support of his/her planned needs for learning, play an important role for the shaping of individual features (Ivanova, Grosseck and Holotescu, 2012).

3.3.6. Mobile Learning

Considered the most popular, widespread and ubiquitous (personal) communications technology on the planet (Gagnon, 2010), the wireless communication technology includes a wide range of mobile devices/wireless terminals, starting from the already classic laptops, notebooks, PDAs, iPods, handheld, palmtops or tablet PCs to the various mobile phone models (with or without specifications such as: touchscreen, clamshell, sliding, possibility to capture images with an integrated camera, editing/sharing them, bluetooth, 3G, radio FM, music player/MP3, recording/rendering video content, Internet connexion, HTML browsers, email applications) and other intelligent devices such as the iPhone, iPad. Used generally for booking tickets, travels, restaurants, banking operations, stock market transactions, listening/downloading music, accessing information about the weather forecast and sports etc., mobile devices create challenging opportunities for learning, defined as mobile education or mobile learning or m-learning.

M-learning implies flexible and collaborative learning modalities, content creation and sharing, anywhere and anytime, at the same time ensuring close relationships between learning in the workplace, at home, at school and/or in a community by anyone on any subject (the Tim Kelly's 4A vision: "anywhere, anytime, by anyone and anything" ITU, 2005). In the context of m-learning, the facilitation and the pedagogical design input of the teacher are critical: "M-learning, being the digital support of adaptive, investigative, communicative, collaborative, and productive learning activities in remote locations, proposes a wide variety of environments in which the teacher can operate" (Laurillard and Pachler, 2007).

M-learning does not represent an expensive process, neither a complex one from a technological point of view, so that installing a wireless network in a higher education institution can be considered a normal extension of the educational system and an instructional one in the continuing formation segment (Khaddage et al., 2009). However, statistics (Smith, 2010) indicate that for most of the European countries and the United States (except South Corea and Japan) m-learning does not represent yet one of the educational methods currently used in formal education, but in the same time that a 94% rate of 21st century college students have a mobile phone, their favourite communication method being text messaging or IM (Lenhart, 2010). Mobile applications are listed in NMC Horizon Project 2012 (NMC HP, 2013), time to adoption one year or less.

3.3.7. Digital Curation

While the classic term curation was used mostly in museums, this activity implying the study of specific techniques, the new buzzword of the web *Digital Curation* (DC) names a rapidly evolving field, in line with the expansion of Social Media, being 'a promising new framework for organizing and adding value to Social Media, complementing the traditional methods of algorithmic search and aggregation' (Duh et al., 2012). Many researchers and practitioners in Social Media appreciated that 2012 was the year of the digital curation. However, Gil (2012) suggests that digital curation it is more than a meta-trend in Social Media, it is 'a big evolutionary step'.

Literature offers many definitions of curation and there are more ways of interpreting curation in the online environment. Although digital curation can be used as a synonym for aggregation, in fact it's a double for 'intelligent aggregation' (Rosenbaum, 2011), 'maintaining, preserving and adding value to digital research data throughout its lifecycle' (The Digital Curation Centre, 2012). In the author' opinion, the digital curation is the collaborative activity of finding, selecting, creatively reorganising Social Media artefacts / assets, relevant for different topics, and sharing them with the aim of future consumption.

Digital curation can be:

a) human-driven (finding and selecting the content on a specific issue is realized by the users, being a creative and intellectual labour – socially curated web);

b) based on *algorithmic / aggregation* techniques (selection follows one's preferences and 'therefore kills serendipitous discovery') or

c) a combination of both.

Are there levels of DC? For e.g. is there a professional and / or amateur level, since the Social Media allow the latter status for any person with an internet connection? Moreover, 'anyone can be a curator', regardless of profession, age, gender, time etc. (Kelly, 2012). Summarizing, the person that gathers and selects the relevant information for one's own audience is a *'digital curator'*. Likewise, curation is possible with all kind of media objects not only text and links (for e.g. audio, photos, videos). Different *type of curated content* can be found on the Robin Good's mind map / blog discovering educational news and information (presentation, case studies, tips and advice, reviews of events and books, photos, infographics, videos and podcasts), learning/narrative communities etc. (Good, 2012).

There is an explosion of tools specifically designed for content curation and that the choice is difficult. Some of the most used digital curation application educators rely on are (Grosseck and Holotescu, 2013a):

a) Twitter (with the help of the '*Discover'* button = interesting/relevant content to users, retweet content to their own network - tweet this/share on Twitter; and use '*TwitterList*' to curate information from other users);

b) Tumblr (Re-blog = 'curate content without producing original content' (Gil, 2012);

c) Pinterest (curate content into 'boards' visually);

d) Scoop.it = 'curating made easy, social sharing with wings';

e) Flipboard (makes a show out of the RSS flux – we talk about social aggregation here);

f) Snip.it (social information curation platform);

g) Storify (is a way of telling stories by using Social Media such as tweets,

photos and videos; useful to capture conference sessions (Kanter, 2011);

h) 'Old' Social Media services: Delicious, Flickr, Pearltrees or Google services (Alert / Reader / Books / Bookmarks / YouTube etc.).

3.3.8. Massive Open Online Courses (MOOC)

The term MOOC (Massive Open Online Courses) was coined by Downes (2008) and Siemens (2010), who facilitated the first such online course, the hundreds of participants being distributed geographically, and the content, communication and collaboration being spread across a large typology of Social Media platforms; the central topic of the course run in 2008 was *Connectivism and Connective Knowledge (CCK08)*[6] (Downes, 2008; Downes e al., 2011).

Some important characteristics of MOOCs are: learner-centered, open access, and scalability.

In 2012, which can be considered the year of MOOCs, this trend has evolved at an unprecedented pace, fueled by high profile entrants like prestigious universities (MITx[7] and edX[8]) and open platforms (Coursera[9] and Udacity[10]) (Watters, 2012a).

Also MOOC is listed in NMC Horizon Project Short List: 2013 Higher Education Edition (NMC HP, 2013), time to adoption one year or less.

In 2013 the portal FutureLearn, the first initiative launched outside of USA (Gaebel, 2013), started to offer MOOCs supported by Open University and other UK universities, and also by the British Council and the BBC: "students have opportunities to connect beyond the immediate course to a world of open educational resources, including The Open University's OpenLearn" (http://futurelearn.com).

The business model for these courses include partnership with testing centers, "job placement programs" (http://blog.udacity.com), but also the design of courses for companies, having separate study groups for employees and specific user analtics (Korn, 2014).

According to (Thompson, 2011), MOOC brings a new "model for delivering learning content online to virtually any person - and as many of them - who wants to take the course" having as central characteristics the learner-centered, open access and scalability approach. Thus, in the online space, the global appetite for global learning becomes a powerful force, with a growing number of universities that try to redefine the idea of education through MOOC (Mehlenbache, 2012; Gaebel, 2013).

However MOOC is not „an educational panacea" (Creed-Dikeogu and Clark, 2013), it is a supplement for traditional courses / a recipe for educational reform which "has the potential to become a global higher education game changer" (Dennis, 2012).

MOOCs are classified by literature in the following categories:

a) *Network-based: cMOOC – Constructivist MOOC*. Such courses - CCK08, CCK09, CCK11, mobiMOOC, etMOOC and eduMOOC - are flexible, with the content co-created, shared and discussed by participants on a large area of

6 Connectivism and Connective Knowledge MOOC http://connect.downes.ca/archive/08/09_15_thedaily.htm
7 https://www.edx.org/university_profile/MITx
8 https://www.edx.org/
9 https://www.coursera.org/
10 http://www.udacity.com/

social media platforms. "They are based on the explicit principles of connectivism (autonomy, diversity, openness and interactivity) and on the activities of aggregation, remixing, repurposing and feeding forward the resources and learning." (Rodriguez, 2012);

b) *Content-based:* xMOOC – "x" represents "extension", "experimental" or "multiplied" up. This type of courses – on the platforms MITx, edX, Coursera, Udacity - are usually offered by universities or their spin-offs and are structured around fixed content and assessment (McAndrew and Jones, 2012);

c) *Task-based:* pMOOC – project-based or task-based MOOC is a new category represented by two courses that we have explored: OLDS-MOOC, that "combines a constructivist pedagogical orientation with a practical and authentic outcome" (OLDS, 2012) and DS106 (http://ds106.us), designed as a storytelling workshop, in which the participants had to create digital stories.

d) *Dual-layer*: DALMOOC (Data, Analytics, and Learning) is a MOOC delivered on EdX starting with October 20, 2014 with a duration of 9 weeks, as an experimental mixture between cMOOC and xMOOC. The participants have had the possibility to choose between multiple learning pathways: either in the existing edX format, as a typical instructor-led course, or in a social competency-based and student-centered / self-directed format, similar to workplace group work sessions, following the Problem Based Learning paradigm (Siemens, 2014; Crosslin, 2014).

There are studies that consider MOOCs as a form of OERs (POERUP project reports[11]); we could say that MOOCs are *live OERs* because MOOCs include open access materials, but also facilitation, communication and collaboration between distributed learners and teachers.

3.3.9. Learning Analytics

Learning Analytics is a relatively new field of research for learning organizations, which appears as a trend in all the Horizon Project Reports starting with 2010, when it was part of the *Visual Data Analysis* field (NMC, 2010-2015).

During the first International Conference on Learning Analytics and Knowledge, organized in 2011 in Canada, the concept of Learning Analytics was defined as "the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs", as cited by Siemens and Long (2011).

Friesen (2013) clarifies the two important terms in the above definition:

- Data about learners: usually these data consist of the records of students' activity in LMSs, such as logging, posting and commenting messages, accessing materials, posting assignments, but also the results in previous courses or inventories of preferences.
- Optimizing and understanding learning: can be realized using a range of possible approaches to (automatically) collect data about learners from multiple sources and to interpret this collection in

11 http://poerup.referata.com

order to predict and improve students' future academic performance, to help those „at risk" with prompt feedback.

Learning Analytics envisages modelling learning interactions, dynamic adaptation / personalisation of the course materials/interactions/assignments/strategies/processes based on large-scale data collection (big data), in order to improve the learning outcomes. An important amount of data is collected by LMSs, but the things become more complex when it comes to collect/analyse the interactions and communications on Social Media platforms which are integrated in the learning process, and also when courses are delivered not only as online or blended courses for tens of students, but as MOOCs for hundreds or thousands of distributed participants.

Siemens and Long (2011) propose the following cycle to reflect analytics in learning, starting from course level to departmental and institutional levels:

- course-level: learning trails, social network analysis, discourse analysis;
- educational data-mining: predictive modelling, clustering, pattern mining;
- intelligent curriculum: the development of semantically defined curricular resources;
- adaptive content: adaptive sequence of content based on learner behaviour, recommender systems;
- adaptive learning: the adaptive learning process (social interactions, learning activity, learner support, not only content).

As Conole (2014) put in her chapter „The Use of Technology in Distance Education": „Learning analytics can be used as a tool to understand learning behaviour, to provide evidence to support design of more effective learning environments, and to make effective use of social and participatory media."

Dedicated Learning Analytics modules were implemented for different LMSs: Blackboard Analytics for Learn can help in finding if student performance is dependent on the instructor's previous training; also the Brightspace LMS (formerly Desire2Learn) comes with an array of analytics capability called Insights, reporting on at risk students' differences between courses or providing metrics related to social learning (Sclater, 2014).

3.3.10. Blended Learning/Flipped Classrooms

Coined more than ten years ago, the blended learning paradigm, (partially) overlapping with the flipped classroom model, is embraced more and more by teachers worldwide, the Horizon Report 2014 giving this approach a time-to-adoption of one year or less (Johnson et al., 2014).

This pedagogical approach means a mixture of face-to-face and online activities and the integration of synchronous and asynchronous learning tools, thus providing an optimal possibility for the arrangement of effective learning processes (Andone and Vasiu, 2012; Holotescu et al., 2007; Naaji et al., 2013).

3.3.11. Augmented Reality

Coined for the first time in 1990 by Tim Caudell, "Augmented Reality" (AR) defines the latest and the greatest concept of computer-aided life, being in constant evolution and redefinition.

Augmented Reality (AR) combines the 'real' world with that which is 'virtual' (Latif, 2012). It is considered an area of real interest, a "promising and effective

technology" (Ivanova and Ivanov, 2011a), still little developed.

Augmented Reality connects and combines real life objects, places and people around us to a variety of information and simulated computer generated experiences (Ivanova and Ivanov, 2011a). AR is used in domains such as: advertising and marketing, architecture and construction, entertainment, medical sector, military field, travel, education.

Although the booming of AR development is seen in domains such as marketing and entertainment (Hamilton, 2011), AR entered in education too in "tangible and exciting ways", with lots of possibilities for teaching and learning environments, even if the research for augmenting education is still in its infancy, with "no actual educational agenda" (Yuen, Yaoyuneyong and Johnson, 2011). However, the educational applications of AR have potential in disciplines and fields of education such as: chemistry, biology, astronomy, medical training simulations, engineering design, mathematics and geometry, architecture, e-learning systems or science education (Billinghurst, 2002; Hamilton, 2011; Yuen, Yaoyuneyong and Johnson, 2011; Ivanova and Ivanov, 2011).

Some tools to create AR educational applications are simple, very friendly and easy to use and require no programming knowledge or skill, like Daqri (www.daqri.com) or Zoobrust (www.zooburst.com) – the 3D storytelling tool for creating 3D books (Carr, 2010). With powerful programming interface, other tools are intended for developers: ARToolKit, Unifeye, Mobile SDK, or Wikitude (Holotescu et al., 2013a).

3.3.12. Open Educational Practices and New Learning Theories

Open Educational Practices (OEP) are defined as "the range of practices around the creation, use and management of Open Educational Resources with the intent to improve quality and innovate education" (OPAL, 2011).

In a broader vision, Open Educational Practices (OEP) mean a transition from a traditional educational process based on resource and with assessment based on outcomes, to a learning process in which learners participate actively in social processes, in judging, reflection and innovation (Conole, 2013).

Behaviorism, cognitivism, and constructivism are learning theories used to design instructional environments before technology to influence and to be integrated in teaching/learning processes.

Open education, governed by Open Educational Practices, implying collaborative learning processes enabled by emerging technologies, are connected with new learning theories, for which an overview can be found in (Dron and Anderson, 2014). Theoretical key concepts for new learning theories are given in this section:

a) *Connectivism* states that „knowledge is distributed across a network of connections, and therefore that learning consists of the ability to construct and traverse those networks"; knowledge is „the set of connections formed by actions and experience" (Siemens, 2005). Connections to social networks for information creation, storing, sharing, and retrieval, but also incorporation of social networking tools to facilitate the flow and exchange of information within a network are important aspects in designing learning environments based on Connectivism (Williams and Whyte, 2011). "Connectivism is built on an assumption of a constructivist model of learning, with the learner at the centre, connecting and constructing knowledge in a context that includes not only external networks and groups but also his or her own histories and

predilections" (Anderson and Dron, 2011).

b) *Learning communities* are groups of people learning together through communication and collaboration; a community could be nurtured by a facilitator; it is possible to include not only the participants in a course, but also external learners and experts, thus becoming a distributed learning community. The principles for building successful learning community announced by Downes in 2001, are still valid (Downes, 2001):
   - focus on learning materials;
   - creation of a sense of whole;
   - integrate content and communication;
   - appreciate participant-generated content;
   - on-going communication between members;
   - access to multiple resources and information;
   - educational orientation;
   - sense of history.

c) *Produsage* is the "the collaborative and continuous building and extending of existing content in pursuit of further improvement", users being both creators and consumers of information and knowledge in collaborative networks (Bruns, 2007). The produsage exhibits the following aspects:
   - is community-based - the community has to be large and varied enough so that members can contribute more than a closed team of (qualified) producers;
   - fluid roles – produsers' participation depends on their personal skills, interests, and knowledge;
   - unfinished artefacts - content artefacts in produsage projects are continually under development, following evolutionary, iterative, palimpsestic paths;
   - common property, individual merit - contributors permit (non-commercial) community use, adaptation, and further development of their intellectual property (free licences), being rewarded by the status capital gained through this process.

   Flexible academic environments are needed which build the collaborative, creative, critical, and communicative capacities of digital students entering produsage communities.

Siemens and Tittenberg (2009) came with a very suggestive representation (reproduced in Figure 3.1) for opening up education using new educational technologies: learners become co-creators of course content, which is enlarged with OERs. Also the communication and collaboration on social networks make possible the interaction with external learners and experts.

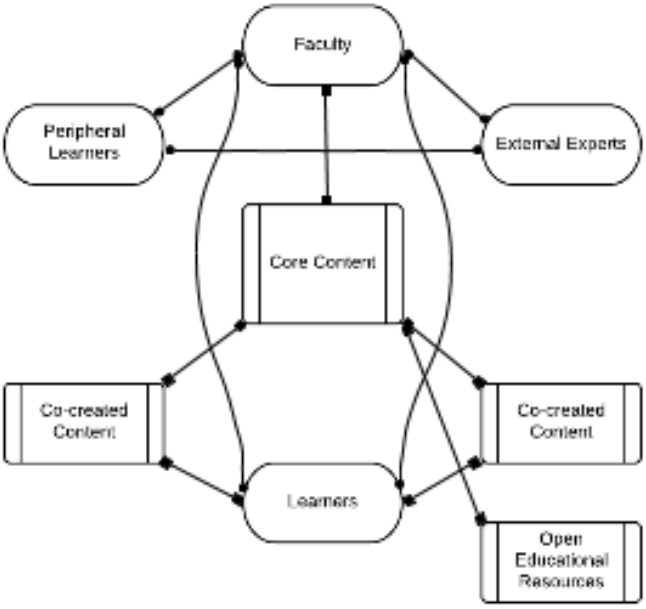


Figure 3.1. Technology enhanced learning (Siemens and Tittenberg, 2009)

„Use of social media creates a more fertile environment for the development of communities of practice, identification of experts, sharing of ideas, and the spread of innovation" (Martin and Parker, 2008).

The use of OERs demands for new models in higher education, new „strategies to increase the reach and impact of open educational resources". Thus in Table 3.4 one can find a parallel between the elements specific to a conservatory educational system and those related to collaborative and open educational practices (OEP) (Geser, 2007).

Social Media have facilitated a shift in focus from the resources themselves towards the practices associated with the creation, use and management of OERs: that is, Open Educational Practices (OEP).

Table 3.4. Open Educational Approaches - based on (Geser, 2007)

Educational approach	**Conservatory approach**	**Open approach** (The use of OERs also leads to opening pedagogical scenarios)
Main notion	Textbook, courseware, additional material	Open resources (learning content) created collaboratively with Social Media
Teacher's role	Instructor, knowledge transmitter	Facilitator of the learning process
Student's role	Information, knowledge receiver	Active participant who develops skills, knowledge, competences
Educational content	Certified material, in accordance with the curriculum	Content created/recreated/shared by teachers and students in a certain educational context

Authors	Several professional authors	Many authors: proffesional authors, teachers, students
Copyright	Rigid - All rights reserved	Open licenses - Creative Commons
Content designing process	Design, assembly, transmission (one to many)	Creation, share, reuse, improvement (many to many process)
Context	Unidisciplinary, not integrated in a continuous learning process; uniform	Part of the learning process, interdisciplinary; personalized, adapted to learning needs/learning styles
Quality check	Realised by experts	Realised by teachers and students within the educational process (in the study group or in the community of practice)
Access	Restricted	Open; part of the content could be accessed only by members
Services	Databases enabling the search and download of materials	Web2.0/open/collaborative technologies
Learning objects	Static units, seldom updated	Dynamic units, interconnected, updated, published in dedicated directories, also on Social Media
Metadata	IMS, LOM	Categories in blogs, tags, RSS, recommendations in social networks, microblogs
Instruments	Applications installed locally (desktop)	Wikis, micro/blogs, RSS, social networks
Content management	LMS	Social/mobile LMS, PLE

"The vision of open educational practice includes a move from a resource based learning and outcomes based assessment, to a learning process in which social processes, validation and reflection are at the heart of education, and learners become experts in judging, reflection, innovation within a domain and navigation through domain knowledge" (OPAL, 2011).

3.4. A Conceptual Model for Open Learning Environments

Kirschner, Strijbos, Kreijns and Beers (2004) state that a learning environment is a unique combination of pedagogical, social and technological components. Founded on our research, we define in Table 3.5 the characteristics of effective Open Learning Environments based on emerging educational technologies and open educational practices identified and presented before, the characteristics being divided in three categories: pedagogical, social and technological.

Table 3.5. Characteristics of Open Learning Environments

Type	No	Characteristic	Description
Pedagogical	1.	Open Educational Resources	Course content extended with Open Educational Resources / Open Access materials / MOOCs proposed by teachers, learners and/or automatically recommended.
	2.	Learners as content co-creators	The content is not created solely by faculty members, but can be collaboratively co-created by students enrolled in that course.
	3.	Collaborative/ distributed assessment; Learning Analytics	Peer and collaborative/distributed assessment have to be integrated, together with issues related to copyright, ownership, security and privacy; optimizing and understanding learning using data about learners.
Social	4.	Interactions with external learners and experts	The students' interactions with external learners and experts on different Social Media platforms could bring new insights on content and enlarge it, could validate the course content.
	5.	Collaborative applications and platforms	Students choose and use different distributed (free) collaborative applications and platforms for their group/cooperative work, also for communication with external participants and experts.
	6.	Public PLE	Students build public profiles/portfolios during courses, which can be extended/used in future courses; also their previous/tacit knowledge could be assessed for a better personalization of the course.
	7.	Time-persistency/ Retrieval	The environments should be *time-persistent* (Mott and Wiley, 2009): an important aim would be to continue the collaboration between participants (and facilitator) after the course end, to maintain access to the course content and interaction, and to assure a continuity of the learning community. Also the content and interaction should be retrieved using different search terms.
	8.	Teacher training/sharing Learning Design	Teachers should continuously learn/improve knowledge and skills in communities of practice, validate and improve learning scenarios, benefit of shadow mentoring from more experienced colleagues and be able to visit/learn from the virtual spaces facilitated by other peers.
Technological	9.	Institutional /administrative management features/privacy assurance	A balance between imperatives of institutional networks and the promise of the cloud to be achieved (Mott, 2010).
	10.	Mobile Learning	Mobile learning is supported and encouraged: students can use mobile devices for a better management of their work (inside and outside educational institution).

All these would mean to break the walls of the university amphitheaters and of the Learning Management Systems toward collaborative platforms, external experts and learners, to use Open Educational Resources and Practices.

Figure 3.2 is a use case for an Open Learning Environment following the principles stated in Table 3.5.

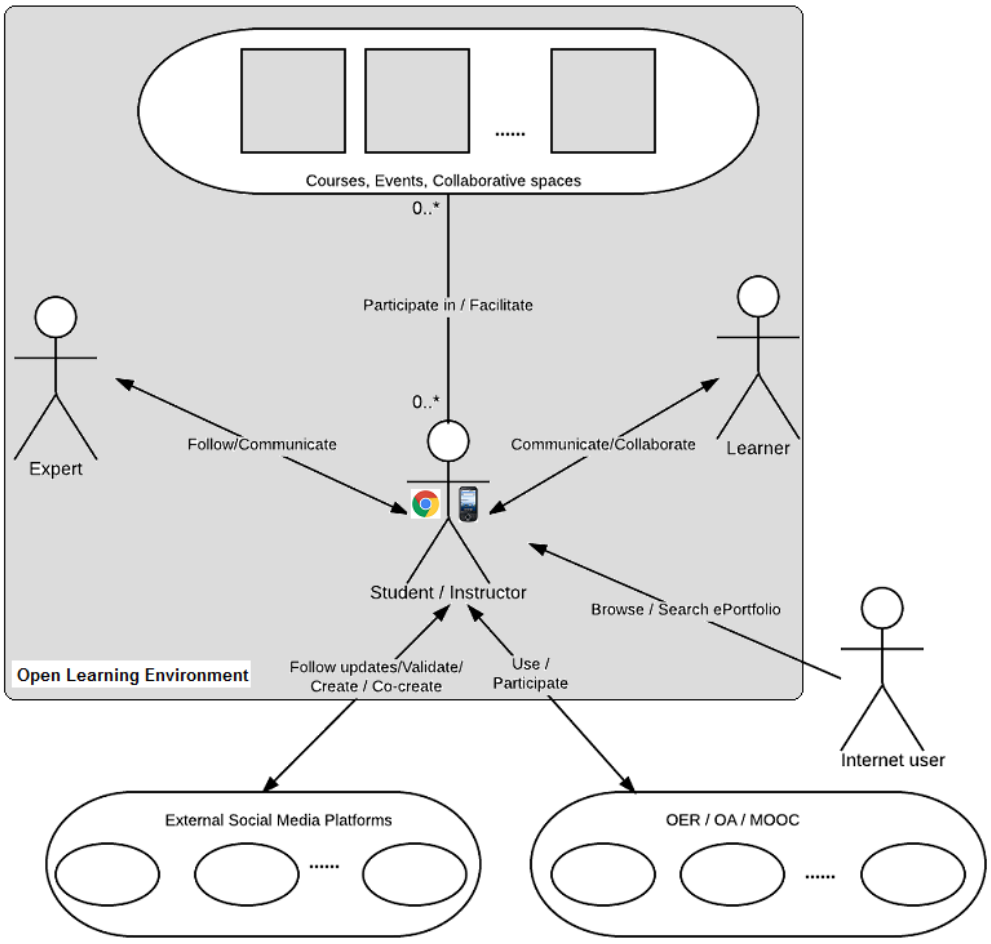


Figure 3.2. Use case for an Open Learning Environment

3.4.1. Classification of learning environments integrating new technologies

The projects and experiences reported in literature we have evaluated, related to integrating emerging educational technologies and open educational practices in learning environments, have lead us to the following classifications:

1. *Enhanced LMS*: In most projects, the courses are enhanced with interactions on Social Media platforms, without an integration in LMS: communication and content co-creation on wikis, blogs, RSS, collaborative bookmarking systems (Holotescu and Naaji, 2007; Bennett et al., 2012), social networks such as Facebook (Grosseck et al., 2011; Rasiah and Ratneswary, 2014; Hocoy, 2013),

microblogs (Ebner and Maurer, 2008; Holotescu and Crețu, 2013). In these cases the time-persistency characteristic of the students' portfolio and of the course content is missing, because they are (at least partially) located on LMSs or on other platforms. Launched in January 2015, Facebook at Work[12], enabling the communication, interaction and collaboration over documents with co-workers/peers, could be a new solution for creating learning communities on this social network, assuring their privacy.

2. *Integrated LMS*: Integrating collaborative tools and connecting Social Media with Learning Management Systems: BYU OLN (Mott, 2010), COOPER - Collaborative Open Environment for Project Centered Learning (Bongio et al., 2006), DIMPLE (Andone, 2011), eLearnTS (Holotescu et al., 2007), eMUSE (Popescu, 2012), iCamp (Wild, 2009), iPLE (Casquero, 2010), Moodle (Braz et al., 2012), PLEBOX (Simões et al., 2013), Google's Course Builder, an Open Source LMS, offering the possibility to host MOOCs, which integrates Google Social Media/collaborative educational tools (Jacoby, 2014). Figure 3.3 is a suggestive representation of open/social LMSs as unwalled gardens, providing openness to social networks and open/collaborative technologies. Interoperability standards, such as LTI and Caliper standards, can be used for exchange of data, roster, context between LMSs and external networks (IMS Caliper, 2013; Hill, 2014). This category limits the possible interaction with external learners and experts, and the visibility of the built PLEs.

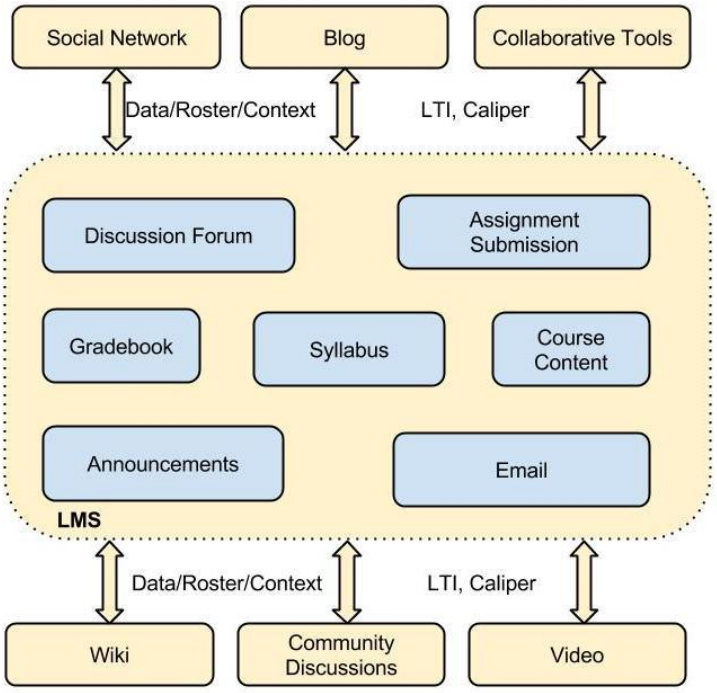


Figure 3.3. Integrated LMS: Opening LMS toward collaborative networks (Hill, 2014)

[12] Facebook at Work - https://www.facebook.com/help/work

3. *Widgets Network*: Integrating administrative and assessment LMS specific features in general social networks, such as ROLE widgets integrated in Facebook or LinkenIn (Faltin et al., 2013). This case could be a solution only for specific courses, thus there is a little chance to establish continuous PLEs and learning or practice communities of students/teachers.
4. *Dedicated Network*: Building dedicated learning social networks that host virtual spaces for courses: NeoLMS (formerly Edu2.0) (Ivanova, 2009c; Ivanova and Popova, 2009), LearnWorlds, attaCommunity (called the Facebook for learning), Edmodo or ProjectCampus[13] (a collaborative platform for group work, which integrates applications such as Dropbox, Google Drive or Kaltura and can be connected with LMSs like Moodle, Blackboard and Canvas). Such educational networks limit the possibility to interact with external experts and learners, to activate on a large category of social networks, and also the openness of the PLEs created by participants.

3.4.2. An Open Learning Environment based on Microblogging

Building the learning community on general/open social networks extends learning with ubiquity and informal characteristics: „connecting learning community with personal and business network of a user makes user experience more live and dynamic supporting practice sharing and exchange" (Faltin et al., 2013).

In 2008, when we have started the research on Microblogging, this Social Media technology was very new, with only a few applications in education; this has represented for us a challenging domain to be explored.

Comparing the proposed characteristics of an Open Learning Environment (Table 3.5) with those of an open microblogging platform, we can note that an environment based on microblogging, one of the top Social Media technologies, offers the premises for:

- communication and collaboration,
- content sharing and co-creation,
- mobile learning,
- openness to Open Educational Resources,
- connections with other Social Media platforms, and
- time-persistency of content and portfolios:

An open microblogging platform:

- with integrated learning management features,
- with collaborative/distributed students' assessment and Learning Analytics,
- with the possibility for teachers training and Learning Design sharing,

would become an Open Learning Environment, following the model proposed before.

Thus, we select microblogging as the base technology for the learning platform to be developed.

In order to establish the requirements for designing an open microblogging platform the next chapter will examine this technology.

3.5. Conclusions

This chapter is a state of the art of Emerging Educational Technologies and practicies, presenting oportunities and challenges brought to opening up education.

We have identified the characteristics of an Open Learning Environment

[13] About ProjectCampus at https://about.projectcamp.us/tour

(Table 3.5), targeting the emerging educational technologies/trends:

- *Mobile Applications/Learning*
- *Open Content/Open Educational Resources/Open Educational Practices*
- *Learning Design*
- *Learning Analytics*
- *Augmented Reality*
- *Digital Curation*
- *Massively Open Online Courses*
- *Blended Learning/Flipped Classroom.*

Having selected microblogging as the base technology for the learning platform to be developed, the next chapter will examine this technologogy in order to establish the requirements for designing such an open microblogging platform.

3.5.1. Contributions

The original contributions of this chapter are:

1. Identification and analysis of the emerging technologies, trends and theories in education, together with a proposed classification of Social Media platforms and applications (Table 3.1 and Table 3.2). The findings were published in (Grosseck and *Holotescu*, 2011a).
2. A conceptual model for Open Learning Environments founded on the identified educational technologies and theories, with characteristics divided in three categories: pedagogical, social and technological.

Chapter 4. Features, Uses and Architectures of Educational Microblogging Platforms

4.1. Introduction

The Web, as a socio-technical environment, comprises various means of interactions, as well as the social practices related to their use. In the online landscape structured on four axes of interactions: communication, collaboration, creation and curation, the microblogging is seen as a new social media revolution.

It is quite demanding to write about microblogging in general, and writing a comprehensive study on its dissemination and pedagogical potential can present even more problems. Even if this social media instrument has come into use only relatively recently (the first platforms appeared in 2006), more and more educators, practitioners and researchers worldwide are actively involved in finding, testing and sharing educational uses for microblogging.

This chapter introduces the phenomenon of microblogging and presents the most relevant options for educators:

- What is a microblog / What is microblogging? What are the resources needed to create a microblog and to explore the microsphere?
- What can microblogging offer in terms of teaching/training, learning and researching?
- Are microblogs educational instruments? How can microblogging be integrated into pedagogical practices?
- What are the theoretical principles (essential for guiding the integration of microblogs into education) and what kind of best practice models are there?
- If there is a *blogology*, the study of the social aspects of blogs, why could we not have a *micrology*, as a pedagogy of microblogs, as well? Could this be the proper term for a discipline dealing with the educational potential of microblogs?

The chapter is structured into two large sections that provide a general-to-specific approach of both theoretical and practical aspects related to the microblogging features and architectures and the impact of microblogs in the educational space. It is part of the first phase of the DBR approach (Figure 2.3), having as aim to prepare the requirements of the open microblogging platform to be developed.

4.2. Microblog and Microblogging Definitions

From an etymological perspective the word *'microblog'* (also, sometimes written with a hyphen: *micro-blog*) comes from the conjoining of the terms 'micro' and 'blog'. The first one is a common used prefix which means 'small' whereas the second term represents a webpage with a continuous, regular and chronological series of information (text and/or multimedia content) about one or more subjects.

In other words, by microblog we understand a blog of small sizes, 'a severe space' with size constraints, as specifies Merriam Webster Dictionary[14], composed by posts of maximum of 140-200 characters, that may sometimes include links, images or video clips and are available to be read either by any internaut or just by a group of people, named followers.

In a world of hundreds of microblogging platforms, the most popular applications include Twitter, Plurk, Edmodo, Tumblr, Identi.ca, Yammer, Shoutem, or Weibo in China.

The person who creates and maintains the entries is called 'microblogger', entries are called 'microposts' and the activity of writing is called 'microblogging'.

The 'lilliputian' character of the notes and the fact that they may be posted from wherever you are (online, by phone, ipads or tablets, sent as SMS, e-mail or instant messaging) has not only changed microblogging into a fast-food writing experience, circumventing the usual editorial rigor, but may be considered as a possible explanation for its popularity.

Microblogging, as a means to express any type of message quickly, was practiced in several ways before the emergence of the well-known microblogging platform Twitter. Such examples of miniature digital communications are:

- saving an online resource using a service of social bookmarking like Delicious (or Diigo), accompanied by a short explanatory/descriptive text – within a certain limit of characters (it basically provides a 'diet' for increasing the size of messages),
- taking notes on a web page with a notetaking software like Zotero, EverNote or other similar services[15],
- describing an image with Flickr or a piece of news with Digg,

can be considered interesting micro-posts, with unique content, even if some of them come from social sites with user-created content.

However, in education, the convergence of different types of social-presence technology (with microblogging in the top) became the link between teachers and students and also the direct contact with the world of educational actors or the needed experts. Thus, 'in academic life, microblogging is about the idea of continuous information on what you do, discover and experience', which in terms of devices and technology, and also in terms of learning mobility and participants in this process, define microblogging as a new form of mobile and social learning (Betta, 2007).

4.3. A brief history of the Microblogging term

Online media contain instances of the word microblog/microblogging from as early as 2002[16]. Thus, Natalie Solent wrote the following on her blog, in a post dated 17 July 2002:

> *"Only micro-blogging today. It's Sports Day. Oh, can I make a date with you all for about this time in the year 2012? By that time my offspring will*

14 Microblogging definition at Merriam Webster: http://www.merriam-webster.com/dictionary/microblogging.
15 A comparison of notetaking software can be found at http://en.wikipedia.org/wiki/Comparison_of_notetaking_software.
16 See for details http://www.wordspy.com/words/microblogging.asp

be, I trust, all grown up, loaded with achievements and equipped with stratospheric levels of self-esteem. I will then feel free to tell some very funny stories about the egg and spoon race back in 2002."

Also in 2002, a few months before, Jeneane Sessum posted a note titled *Microblogging*[17], in which she challenged Internet users to write about their personal experiences, thoughts, emotions, feelings, using only a few words and short sentences.

The term *microblogging*, however, only attracted general attention as a major communication channel in 2007, as a consequence of the fact that Twitter became the main star of the Southwest Conference in Austin, Texas. On huge screens, the creator of Twitter, Evan Williams, invited all conference participants to follow what was being presented and discussed. Williams did not invent a new means of text communication, but his campaign created the conditions needed for messages to become powerful[18].

As Passant et al. (2008) said, in the recent social phenomena of Web 2.0, Twitter is the missing link between blogging and instant messaging.

4.4. Classifications

The format that is the closest to the microblog is the *tumblelog*, a less structured variant of a blog. Accent is placed on the flow of thoughts, as the author concentrates his/her ideas in short articles and adds colour to the content with pictures, music, videos, quotes and/or links. The main characteristic of a tumblelog is logical inconsistency, without categories, taxonomies, comments or even titles.

The first tumblelog ever created is considered to be Anarchaia.org, by Christian Neukirchen, a place where the author intended to post quickly, without spending too much of his time, about things that drew his attention. The most popular tumblelog applications are Tumblr and Posterous (bought by Twitter in March, 2012).

Microblogging also provides the possibility to publish content in a multitude of formats, which thus gives the first criterion for microblogs typology:

- *classic* – only text-format content (in the beginning Twitter being the classic example), possibly including links;
- *photo* – a content published in image formats (DailyBooth, Ifotoyou);
- *video* – a microblog with content in video format (59sec-video);
- *audio* – a microblog with content in audio format (audioboo.fm, blip.fm);
- *linking/sharing* – short-URL services, for instance Delicious as a link compilation;
- *multimedia* – a microblog with content in multimedia format (Cirip.eu).
- *concept* - posting topics and gather audience's opinions (Flipter); sharing emotions/feelings (feelblogr, IRateMyDay.com), location-based service (PingGadget – free conversation tool) etc.

There are also specific digital regimentations according to:

- *The length of the message:* there are variations when the message undergoes dramatic simplification. Well-known is *nanoblogging*: the message consists of only one word. A concrete example of a micro concept

17 See for details http://allied.blogspot.com/2002/04/microblogging.html
18 See for details: http://www.blogschmog.net/2007/11/17/a-brief-history-of-microblogging/

taken to the extreme is adocu. Although we fail to see the interest presented by such an application, we nevertheless try to understand its usefulness: that of super-synthesis, an 'in extremis' concentration of ideas. Users can basically write as many characters as they wish, but they cannot use spaces.

- *The device*: for instance mobile-only (qik).
- *The social presence services*. Social networking sites such as Facebook, MySpace or LinkedIn include a microblogging feature as *status update*[19].
- *The target group*: educational-scientific community included (Edmodo, Cirip.eu, ScienceFeed), organisational (Yammer, Swabr – an Enterprise Microblogging Company from Germany).
- *The content*: corporate, news (CNN), educational, broadcasting, brand (Pepsi), marketing, artistic, spammer, non-profit, etc.
- *The user:* personal, multi-author, community – we can consider them niche microblogs (twingr).
- *The language / country:* Weibo in China.
- *The openness* of platforms (an open source microblogging platform is identi.ca).

Thus, premises for the appearance of new series of applications / current concepts were created, such as *micro-media* (for example blogs about the lifestyle in different countries), *micro-news* (opinions of the digital landsmen about subjects of interest or notes about ongoing world-events), *micro-health* (for example timeline of a person or population health in certain moments and/or places) or *micro-learning* (micro-perspectives in the context of education – learning, treaning and researching). Thus, an entire array of terms have been developed based on the *micro-* particle: micromessaging, microsharing, micromedia, microformats, microlinking, microcontent, etc. (therefore the issue became a subject to be studied from a linguistic point of view, too).

Once they have been engaged in the microblogging phenomenon, many users decide to use *social aggregation* services such as FriendFeed or Profilactic, which actually focus on the 'quantitative side' of users' profiles (i.e. managing several accounts) as a premise for the qualitative analysis of their virtual identities. The virtual identity built on various sites is collected via a pseudoblog containing the news related to a user from the social networks on which he/she owns accounts or from suggested URLs/RSS feeds. There is also a flipside: for instance there are applications that sends micro-posts to many social networks.

4.5. Microblogging Platforms used in Education

4.5.1. Twitter

Twitter, the most popular microblogging system, was launched in July 2006 by Obvious Corp with the name Twttr, and was renamed as Twitter in the fall of the same year. The company had started with ten employees, coordinated by Evan Williams, the co-author of Blogger, Jack Dorsey and Biz Stone.

19 There are also location-based services (that identify and publish a person's location), such applications being Plazes, Foursquare, or Hotlist (the location has a status component too, for sharing information about user's current activities).

The initial idea dated back to 2000, when Jack Dorsey started to conceive a simple interface design for LiveJournal, through which he could enable truly "live" journal entries from wherever and whenever, developing the concept of providing Web-based access to "status information"[20].

Twitter's robust, elegant and simple system has gained important popularity, having 284 million registered users in January 2015, who send 500 million tweets per day, while 80% of the active users are on mobile[21]. More than 10 new accounts are created each second and over a thousand tweets are consumed daily by an active user (Bernstein, et al., 2010). Also 75% of the World Leaders have Twitter accounts, according to a study by Digital Daya (2012).

The users called *twitterers*, can tweet via the web, SMS, instant messaging clients and by third party applications, a percentage of 60% of posts being sent from such applications. The notifies can be received in real-time as SMS, IM or RSS.

By default posts are publicly visible and are limited to 140 text characters in length; this is why Twitter was called *social networking in 140 characters*. Posts may upload or embed images (from Flickr), video clips (from YouTube or Vine, a company acquired in October 2012) or presentations (created with SlideShare).

Twitter's co-founder Biz Stone argues that "creativity comes from constraint" and also that "you can change the world in 140 characters"[22].

Twitter's original stated purpose was to answer the question "What are you doing?". Later, in 2010, reflecting the taxonomy of users (daily chatter, conversations, sharing information and reporting news (Java et al., 2007)), focused on the ongoings in the real world, the question became "What's happening?".

Each user is able to monitor the notes of other users, who will be listed in the profile, under Following, thus the user becomes their Follower. Twitter suggests also to follow people with similar profile or to browse users tweeting about specific topics/categories (section @Connect of a user's profile).

Microblogging offers a way to get past Dunbar's number of 150[23] (Dunbar is suggesting that 150 is the limit of the number of people we can be heavily engaged with, and this is limited by the capacity of our brain): on average, a twitterer follows 170 users and has 115 followers; the online interaction depends on cultural specificity: Brazil has the highest online friends number – average of 481 per user, while Japan has the lowest number – just 29 friends per user[24]. The interaction/sharing experience on Twitter, and on microblogging platforms in general, can be called *ambient intimacy*: "being able to keep in touch with people with a level of regularity and intimacy that you wouldn't usually have access to, because time and space conspire to make it impossible"[25].

Posts can be classified by using hashtags, and you have the option to view either worldwide trends or local trends, based on your phone's location (section #Discover of a user's profile). Users can retweet or favorite tweets. Hashtags and

20 Blog post http://www.articleinput.com/e/a/title/How-Jack-Dorsey-came-up-with-the-idea-for-Twitter/

21 https://about.twitter.com/company

22 Blog post http://c2mtl.com/biz-stone-talks-in-montreal-%E2%80%93-c2-mtl-loves-the-sound-bytes/

23 Note Dunbar's Number has limited relevance to social media http://thefutureplace.typepad.com/the_future_place/2011/06/dunbars-number-has-limited-relevance-to-social-media.html

24 Note 99 New Social Media Stats for 2012 http://thesocialskinny.com/99-new-social-media-stats-for-2012/

25 Note Ambient Intimacy http://www.disambiguity.com/ambient-intimacy/

retweets, now platform core features, were originally conventions adopted by twitterers, which were later formally implemented by the Twitter staff.

"Already a fabric of our digital culture, Twitter is now ingrained in our digital DNA and is reflected in our lifestyle and how we connect and communicate with one another. Twitter represents a promising intersection of new media, relationships, traditional media and information to form one highly connected human network."
(Brian Solis, 2012)

The numerous mashups based on Twitter API have an important contribution to this platform's popularity, together with the possibility to follow and interact with people worldwide and to be updated with what is happening around the globe, thus overcoming geographical, economic or political barriers. For example, tops may be made according to the number of followers or retweeted posts, such mash-up applications being Tweepz, Twitaholic or WeFollow.

Among the minuses there is the impossibility to create groups, which would preserve the whole history of interactions between members and private groups would assure privacy, important in educational settings. A partial solution for groups are the lists, which were implemented in 2009: a list aggregates together users, a complete tweet stream for everyone appearing on the list's page. A user can create lists including not followed users and can follow lists built by other users. Another minus was the search history of four days, too short for some types of applications, such as following a topic or the reactions to an event, a limit introduced in 2010, but eliminated in 2013.

On March 12, 2012 Twitter acquired the well known mobile blogging platform Posterous, so innovations in Twitter sharing and mobile features were expected to appear. Instead of these, Posterous was shut down in April 2013.

The *Twitter architecture* should support "the health, reliability, and scale of the network" of this "open, real-time introduction and information service"[26]. Initially built on Ruby on Rails, the centralised architecture of Twitter has moved to Java in 2011. The core operating system is Linux, and the database is MySQL. Each tweet is given a unique ID by using a program called snowflake[27], and its geolocation data is noted by Rockdove; after being checked by a combination URL shortener and spam detector called t.co, the tweet is stored in MySQL (Vaughan-Nichols, 2012). In 2012 Twitter has joined The Linux Foundation: "Twitter's philosophy is to open-source almost all things", declared Chris Aniszczyk[28], open-source manager at Twitter.

A proposal about the addition of meta data to tweets, called *annotations*, was described in 2010, but has not yet been implemented. The annotations would be a solution for the platform semantics, that would represent a new sandbox for Semantic Web applications. With a maximum size of 512 bytes, each annotation adds three new fields to those a tweet already has (authors, timestamps, replies, locations[29]): a namespace, key and value - and each tweet can have one or more annotations[30].

26 Note The Twitter Platform http://blog.twitter.com/2010/05/twitter-platform.html
27 https://github.com/twitter/snowflake
28 http://twitter.com/cra
29 Map of a tweet http://elmack.files.wordpress.com/2010/04/30146338-map-of-a-tweet.pdf
30 Note Twitter Annotations are a big deal http://www.mmmeeja.com/blog/semantic-web/twitter-annotations-rdf.html

Concerning the educational area, a huge amount of academic papers related to integrating Twitter in teaching-learning process have been written, starting with the pioneering period 2007-2008 (Java et al., 2007; Grosseck and Holotescu, 2008). Additionally conferences, courses and workshops have been organized on this topic. Today a growing number of teachers, students, other educational actors, universities, schools, or scientific events have an identity on Twitter.

"Twitter is a good tool for jumpstarting large-scale educational reform, it enables easy access to educational visionaries from all over the globe, and highlights where government policy is hopelessly inadequate across the world."
(Justin Marquis, 2012)

The 2010 Faculty Focus survey of nearly 1,400 US higher education professionals found out that more than a third (35.2%) use Twitter "to share information with peers", "as a real-time news source" , "to communicate with students" and "as a learning tool in the classroom" (Faculty Focus, 2010).

The study of Junco et al. (2011) demonstrated that, in order to have impacts on real-world academic outcomes, namely student engagement and grades, Twitter usage has to be designed and facilitated by the faculty in order to support the seven principles for good practice in (undergraduate) education (Chickering and Gamson, 1987):

(1) student/faculty contact: contact congruent with students' digital lifestyles to be provided;

(2) cooperation among students: students ask each other questions, provide emotional support to each other, and create and schedule real-world study groups;

(3) active learning: assignments should help students relate the course material to their own experiences both inside and outside the classroom;

(4) prompt feedback: not only for their assignments, but also for other questions and issues they could face;

(5) emphasizing time on task: based on the Twitter stream, discussions and learning community building could continue outside the classroom and also after the course end date;

(6) communicating high expectations: in students' academic work, learning projects, and out-of-class activities;

(7) respecting diversity: different learning styles, also encourage students who otherwise may not be active participants in class, to participate online.

Thus, based on their experience using Twitter with their online students, Dunlap and Lowenthal (2009) offer the following five guidelines:

(1) establish relevance for students

(2) define clear expectations for participation

(3) model effective Twitter use

(4) build Twitter-derived results into assessment

(5) continue to actively participate in Twitter.

Following these guidelines, the Twitter based learning community helped students attend cognitive presence: "interacting with teachers and other professional practitioners in Twitter, the students constructed meaning through sustained communication", while faculties for teaching presence: "the teachers clearly engaged in interactions with students via Twitter attend to instructional management issues and students' knowledge building" (Junco et al., 2011).

Definitely, all these principles could be applied when other microblogging platforms are used.

4.5.2. Edmodo

Launched in September 2008 and built on a microblogging model, Edmodo is basically a private online social platform designed specifically for teachers and students to share ideas, files, events and assignments.

Teachers can publish assignments, receive and grade them when completed, maintain a class calendar, store and share files, conduct polls and quizzes, and send SMS alerts to students. Students can easily follow the class stream and see a summary (teacher' commentaries included) of their grades on all assignments (Nevas, 2010).

"Edmodo is very good especially in the Elementary grades because it provides a ,walled garden' that the teacher can supervise and the students can begin to learn about the internet in relative safety. It is set up and owned by the instructor, but the students add content, fulfill assignments and can even see the class schedule and chat with friends. One downside of this technology is the fact that it is teacher-owned and operated." (Williams, 2011)

In March 2012, an API was released, already other applications being connected with Edmodo[31].

The service is free and gained an important popularity, having more than 46 million users in January 2015, who integrate it in the teaching-learning process[32]. In a top of Learning Management Systems published at the end of 2012 (Capterra, 2012), Edmodo is in the second position, between Moodle and Blackboard, which demonstrates the popularity gained in only a few years by this microblogging platform, while the other two LMS had more than ten, respectively 15 years to consolidate their positions in the market.

Case studies on educational uses of Edmodo can be found in a special section of the site[33], and in many presentations on Slideshare (Giacomantonio, 2011), some of the most interesting being:

- Conduct a live online Socratic seminar at an appointed date and time outside of school classes. Open the session to everyone willing to join and send invites, reading links and topic to colleagues and students at school;
- Groups can be formed for common study of materials, pen pals, reading groups, current events;
- Differentiation - use the small group feature to move students into and out of groups based on readiness and other factors and deliver appropriate questions to each small group. It's very easy to move students into and out of small groups so that no one is "stuck" in a group he/she doesn't belong;
- Embedding presentation tools (glogster, Pixton Comics, voki, animoto, prezi, voicethread, word clouds);
- Coaches and sponsors can use the calendar for important dates/ matches/ meets/ games/ practices. If a practice is cancelled or moved students will receive an immediate notification text message;
- Encourage students to read and help to make their reading experience more engaging within an Edmodo book club;
- Give students an interactive educational experience through mobile devices;

31 Watters, A. (2012b). *Edmodo makes the move from Social network to Educational platform*, blog post retrieved from http://hackeducation.com/2012/03/06/edmodo-makes-the-move-from-social-network-to-education-platform/ on March 12, 2012.
32 Edmodo start page http://www.edmodo.com
33 http://blog.edmodo.com/2011/07/06/ideas-for-using-edmodo-add-yours/

- Create a "teacher lounge" where teachers can discuss ideas and share content;
- After the school year ends, keep in touch with students and help them stay connected with one another.

Research papers have been also written on the topic of Edmodo: Nevas (2010) attempted to answer to the question "How can the Edmodo microblog increase student engagement and performance through collaborative learning tasks?", while Holland and Muilenburg (2011) described a study in which students participated in literature discussions on Edmodo, their initiative being encouraged and supported by reciprocal teaching strategies.

4.5.3. Plurk

Opened in May 2008, by a company located in Canada, Plurk[34] has a unique, relaxed and intuitive interface, showing updates, called *plurks*, in horizontal form through a scrollable timeline, which can be clicked and dragged left and right to reveal more dates.

Plurk is described by its implementation team as: "a really snazzy site that allows you to showcase the events that make up your life in deliciously digestible chunks. Low in fat, 5 calories per serving, yet chock full of goodness".

Sent online or through instant and text messaging, *plurks* can contain media such as videos and images and also *qualifiers*, which are color coded verbs used to represent a though.

The Karma system, a metric for people's activity, encourages participation and continued conversation; more options and features are made available when Karma increases.

"Like" and "Meh" buttons let users vote on statuses.

Plurk is most popular in Philippines and Taiwan (Narkhede et al., 2010).

An exploratory study on Plurk user behaviors categorized plurkers into four types: reality shows, mood bulletins, kiosks and propaganda vehicles (Tu et al., 2011).

The features to group friends in *cliques* with whom to share plurks and threaded conversations are useful for educational settings.

Many educators are using Plurk in their activity and there are some active communities of edu-plurkers[35].

Plurk has interesting educational uses: the platform was used in an university course as an artificial intelligent software agent, so-called plurk robot; the activities carried out during the course included teaching, team-working, planning, designing (hardware and software), testing, debugging (or problem-solving) and applying (Shen, 2010).

4.5.4. Yammer

Yammer[36], asking "*What are you working on?*", originally launched in September 2008 as an enterprise microblogging service, evolving to an enterprise social network, which has now more than seven million users[37].

34 http://www.plurk.com
35 Edu-plurkers communities at http://plurk4educators.com and http://groups.diigo.com/group/plurking-educators.
36 http://yammer.com
37 Blog Note How many people use the Top Social Media, Apps & Services? http://expandedramblings.com/index.php/resource-how-many-people-use-the-top-social-media

Its many educational uses are facilitated by characteristics such as: public and private groups, replies and threaded conversations, file and photo attachments, knowledge bases search, events, polls, and questions applications, also Twitter and Microsoft SharePoint integration (Beliveau et al., 2011; Loh, 2011). Yammer was bought by Microsoft in June 2012, enabling users to work collaboratively on Microsoft Office documents and to use Yammer features in a SharePoint Server 2013 on-premises deployment (Microsoft, 2013).

According to Yammer CEO David Sacks, in October 2011 1,692 of more than 100,000 organizations using Yammer are in the educational industry, most of the participants being graduate students (Wecker, 2011).

"Yammer is unique because it allows schools to expand problem-based learning (PBL) opportunities, where students look up answers to questions and share information with the group, rather than memorizing lectures. This can be seen as the "brass ring" for teaching problem solving skills to health professionals" (Wecker, 2011).

Yammer proved a flexible environment for a Community of Practice (CoP) about Information and Communication Technology, at Charles Sturt University, Australia, supporting blended learning in the light of social presence and organisational culture (Uys, 2010).

It's worth to mention here Sharetronix[38], a platform similar with Yammer, which is available as an Open Source implementation[39].

4.5.5. Identi.ca

Identi.ca[40] is an open source microblogging service, started in July 2008, which provides many features not currently implemented by Twitter, including XMPP support, export and exchange of personal and friend data based on the FOAF standard, trackbacks, native video playback, OpenID and groups, making the platform an interesting choice for collaboration.

Identi.ca is the first service to support OStatus (formerly OpenMicroBlogging) specification, an open protocol allowing different microblogging services to inter-operate and people on different social networks to follow one another (Van Buskirk, 2009). OStatus comes to support decentralised architectures, important fundamentals of the web, which were generally neglected by microblogging applications.

Although there aren't so many references in literature, identi.ca has gained success in the higher education sector, see for example the group "Women in Higher Education"[41].

Moreover, a study conducted by Ebner et al. (2010) at University of Graz, Austria, aimed to investigate the use of microblogs, in particular an implementation of Identi.ca in Higher Education. The following research questions were addressed:

- How are students using microblogging in the context of their course?
- Can public and individual timelines using microblogging be used for documentation in the sense of "process tracking by timeline" (process-oriented learning)?

38 http://sharetronix.com/
39 http://developer.sharetronix.com
40 http://identi.ca
41 http://identi.ca/womeninhighered

- Does microblogging foster informal learning?

The researchers analyzed college students' use of microblogs during a course in order to explore their pedagogical affordances. The results of this study led to the conclusion that "Microblogging is the opportunity to be a part of someone else's process by reading, commenting, discussing or simply enhancing it, supporting process-oriented learning by a constant information flow between students and between students and teachers."

4.5.6. Twiducate

Twiducate[42] was launched in 2009, as an educational private social network, having almost 170,000 users in January 2015. Even if Twiducate founders are K-8 teachers and the platform was primarily designed for the pre-university system, it is used in Higher Education settings too (Luo and Gao, 2012).

The platform is a safe collaboration tool for teachers and students: in class groups they can post discussions, deadlines, homeworks and quizzes. Images, links (class bookmarks), videos and documents may be embedded in notes.

A founder pointed out: "Twiducate started as a means to teach students the value and importance of online privacy. It is also meant to be a new medium for teachers to promote critical thinking, provide feedback and allow students to collaborate on their work in a microblogging format. The value for teachers using Twiducate is that the content is private and students never have to enter an email address."[43]

Chat is a feature provided by this platform, not found on the others presented here: Twiducate Chat is "excellent for developing metacognitive skills and encouraging your students to learn from other students" (Coles, 2011).

4.5.7. Other Microblogging Platforms

For the current microblogging platforms, the following problems were identified that prevent the exploitation of this technology to its full potential (Passant et al., 2010; Cheong and Ray, 2011; Penela et al., 2011; Smith et al., 2012):

- *centralised architectures* which may cause performance bottlenecks, single points of failure and malicious attacks; thus, decentralised solutions would improve the robustness, scalability, availability and reliability of the micro-services;
- *lack of machine-readable meta-data* about posts (creation date, author, recipient, etc.); Twitter has adopted microformats for describing followers (and subscribers) lists, but more information is require to efficiently use meta-data;
- *lack of semantic in microblog posts*, which do not carry any semantics, making their querying and reuse and the building of any kind of intelligent system on top of them quite difficult; the #hashtags semantics are not a complete solution, being only channels of communication and providing a context for the conversation;
- *information overload* because the stream available for a user doesn't take into account his or her current context;

42 http://www.twiducate.com/
43 Blog post http://blog.sagrader.com/2010/01/25/twiducate/

- issues of *seamless access, ownership, and control*: the competition and lack of integration among the micro-sharing services lead to the need for the user to fragment his or her own data into each of these "silos"; once the data has been handed over, the user has little control over the way it is accessed and visualised, how or where it is stored, and with whom it is shared or disclosed.

A few microblogging implementations that address these issues are presented in what follows.

a. Cuckoo is a decentralised, socio-aware microblogging system, built on a hybrid overlay structure, in that it utilizes peer-to-peer techniques to reduce bandwidth and storage consumption for the server side based, thus providing scalability and reliability (Xu et al., 2011). Also, a Cuckoo client maintains the social information and takes advantage of social relations such as friend, neighbor, follower and followee. For designing Cuckoo, the authors used a 20-day Twitter availability measurement and evaluated the prototype based on a trace-driven emulation of 30,000 Twitter users. Compared to the centralised approach, Cuckoo achieves 30-50% server bandwidth savings and 50-60% CPU load reduction, while guaranteeing reliable message delivery, so it provides good performance for microblogging both as a social network and as a news media.

b. SMOB - Semantic MicrOBlogging - is a distributed and decentralised microblogging system that relies on (Passant et al., 2010):

- *ontologies*, used to define common semantics for representing microblog posts: Semantically-Interlinked Online Communities[44] (SIOC) for expressing social data, Friend-of-a-Friend[45] (FOAF) for defining people, their main attributes and their social acquaintances, Online Presence Ontology[46] (OPO) for describing a user's presence/context, and Meaning Of A Tag[47] (MOAT) to model semantic tagging capabilities;
- *distributed hubs*, spread across the Web and used to publish data, exchanging information (posts and follower / following subscriptions) based on the previous ontologies;
- *interlinking components*, making microblog posts interlinked with other resources on the Web
- *faceted presence*, so that one can browse status messages corresponding exclusively to his or her current context.

c. WebBox is a system that supports decentralised and privacy-respecting micro-sharing, using existing Web standards (Smith et al., 2012). Unlike existing centralised sharing platforms where data and applications are inextricably tied, on WebBox data can be used by multiple applications and services and shared directly among peers: user's data can be managed in a single location, this leading to easier management and reducing fragmentation and redundancy across sites and services. WebBox exhibits the following key features:

- *fully-decentralised* - each person runs his or her own WebBox, eliminating

44 SIOC http://rdfs.org/sioc/spec
45 FOAF http://xmlns.com/foaf/spec
46 OPO http://online-presence.net/
47 MOAT http://moat-project.org/

the need for central servers;
- *flexible data representation* - shared data can represent any structured data, including future applications;
- *granular sharing data* - resources can have different granularity, they may also be shared with individuals or with groups;
- *secure authentication and personal privacy* – the system is able to control where data is stored and with whom it is shared;
- *Web-based critically* - standard Web protocols are used to make it easy to integrate with existing environments and software.

d. ***miKrow*** is an intra-enterprise semantic microblogging tool that allows its users to share notes expressing what are they doing/working. Each time a user posts a new note, some related content is offered, taking into consideration the semantic similarity between texts and context (location) (Penela et al., 2011). ***miKrow*** has two main components, a semantic engine and a microblogging engine, for which Google's Jaiku microblogging platform has been used and extended. The semantic engine of ***miKrow*** implements the semantic indexing and search:
- *semantic indexing* - when a new status message is posted, its content is analyzed and included into a message index (status repository), allowing future retrieval; similarly, a repository of expert users (experts repository) is populated by relating the relevant terms of the message with the particular author;
- *semantic search* - two searches are launched and performed in the background when a new message is posted; the search on the status index returns semantically related status; also, the search on the experts index returns semantically related people, such as other co-workers with experience on related areas.

4.6. Educational Uses of Microblogging in terms of opportunities, contexts, challenges, advantages and limits / risks

4.6.1. Educational opportunities

As the technology of microblogging is adopted in a variety of contexts, its usefulness becomes more and more compelling for educational actors, from schools and universities, from training and workplace learning. As a consequence, four microblogging platforms (Twitter, Edmodo, Yammer, and Cirip.eu) featured the last tops 100 tools in education, compiled by the Centre for Learning & Performance Technologies UK from the proposals of hundreds learning professionals worldwide[48].

The aspects most emphasized in literature (Suster, 2010; Gavan, 2011) reveal that microblogging:
- is a tool for sharing information and resources, bringing also comments and validation of them;
- offers the opportunity to discuss / practice different types of online discourse, and to organize ideas and reflections;

48 C4LPT (2012). *Top 100 Tools 2007-2011*, http://c4lpt.co.uk/top-tools/top-100-tools.

- creates instant and mindful communities in unexpected environments;
- can be successfully used in the teaching-learning process;
- promotes a collaborative virtual environment which fosters process-oriented learning;
- facilitates the work of multidisciplinary groups;
- is a useful tool for cooperation and collaboration in project management or for assessing peers and students opinions;
- is a viable platform for meta-cognition;
- is the preferred support for conferences or other events;
- is used in the convergence of knowledge;
- facilitates the creation of a personal learning network;
- allows exploration of colloquial language (important in learning foreign languages);
- can be a reference service in libraries;
- to get instant feedback from students;
- it's the ultimate 'wisdom of the crowds' curation application and also a curated RSS.

4.6.2. Didactical context

Although most microblogging platforms are not perfect, different actors from the educational spectrum have found that microblogging can be successfully adopted and integrated in the teaching-learning process or in other didactical activities (Java et al., 2007; Parry, 2008; Reinhardt, Ebner, Beham and Costa, 2009; Grosseck and Holotescu, 2008; Dunlop and Lowhenthal, 2009; Borau et al., 2009; Ebner et al., 2010). As general uses / contexts of microblogging platforms in education can be underlined:

- *Learning communities.* Communication on microblogs may enhance traditional courses, by exploring the potential of the microblog in a *formal and informal context*. It offers students the opportunity to discuss / exercise various types of online discourses (voice, aim, audience), to structure their ideas, reflections, it promotes discovery through serendipity. By incorporating in the instructional environment a social and a group component, we become more human, more polite, more available and visible for social activities.
- *Exploring collaborative writing:* Microblogging promotes writing as a pleasant activity, enhances the students' written expression skills, those for lecture, offers students the chance to pass from personal writing to public writing (evocation, realizing sense, reflection).
- *Collaboration between schools, universities, countries:* pupils, students, teachers share ideas, experiences, projects by social learning.
- *Instrument for evaluating opinions*. Used in the academic environment, microblogging applications develop, stimulate interactions on a certain topic, allowing the expression of ideas and feelings related to a situation or a life experience.
- *A viable meta-cognition platform*: a way of thinking about one's own way of thinking / learning / understanding.
- *Support for conferences or other events* (learning sessions, workshops): a very simple way for the participants in a scientific event to share thoughts about a certain session and the activities taking place during it, being thus useful for those who cannot participate, but also for future reflections.

- *Building a Personal Learning Environment (PLE) / Personal Learning Network (PLN)* for each registered user or accordingly to Howard Rheingold (2011): 'it's not just about knowing how to find experts, co-learners, but about exploration as invitation to serendipitous encounter'[49].
- *Research and dissemination tool*: Microblogging proved to be one of the most popular tool used in a professional research context (see the next section). Twitter together with Skype, Google Docs, and YouTube (CIBER, 2010) are used intensively both 'to share information with peers' and 'as a real-time news source', being the most common activities of teachers (Faculty Focus, 2011).

4.6.3. Research context

Perhaps one of the most debated use of microblogging in education is the research. Popular microblogging services used in research are: Twitter, Friendfeed, Cirip or ScienceFeed (http://www.sciencefeed.com). The last one is a microblogging platform dedicated to the online scientific community acting as a 'bridge between online scientific networking platforms, scientific databases' and scientists from all over the world.

At the question raised by researchers Mayernik and Pepe (2009) *'Can micro-blogging be used for field research?'* we noticed in the literature some answers of the most frequent uses for different research contexts such as the following (Ovadia, 2009; Costa, 2011; Gilpin, 2010; Grosseck and Holotescu, 2011):

- new form of *scholarly communication*: 'answer other people's questions' or 'ask questions relevant to your practice', getting in touch with science journalists, science organizations or doctoral students, get advice on how to improve research;
- a new form of *authoring, publishing, researching*;
- a tool for *disseminating scientific information,* including the own results;
- a s*ocial collection* to manage:
  - *people* (e.g. to follow list of researchers on Twitter)
  - *messages* (favorite notes, to resend / to comment - @ / RT; D for scholarship authority or supporting critical discussions)
  - *hashtags* (social news, following scientific events) etc.;
- a *data repository* to collect:
  - *information* from science newsfeeds and from various individuals / institutions;
  - *links* to other valuable resources;
- a *search tool* 'more appropriate for capturing hyperrcurent information';
- an *outreach tool* aimed at promoting public awareness (and understanding) of science and making informal contributions to science education;
- a *platform for social micro-interactions* to connect people (building personal relationship with other researchers, co-colleagues) and also to engage in conversations with an active community of scientists;
- a *way to track trends-in-time* like natural disasters or political events, mentioned in messages;

49 Rheingold, Howard (hrheingold), „Explore – it's not just about knowing how to fiind experts, co-learners, but about exploration as invitation to serendipitous encounter", 2 January 2011, 4:38 AM Tweet. https://twitter.com/#!/hrheingold/status/21394804449480704.

- *a micro-peer method* for learning, reviews, feedback etc.

A recent study (Grosseck and Holotescu, 2011) indicates that academic uses of microblogging for research purposes range from searching for scholarly content to academic publishing:

- *Search for scholarly content*: academics are looking to discover new information, ideas or practices. By looking for specific ideas the researcher can scan easily the stream for news other than academic papers, science magazines, data bases, scientific discoveries etc.
- *Dissemination channel* for promoting of own results / articles / projects or studies / formal products.
- Tool for *reviewing the literature*, *collecting and analyzing research data*, "for listening what other researchers are going to say" (Gilpin, 2010).
- Talking and *sharing experiences online*, communicating scholarly ideas, collaboration between colleagues, networks of stakeholders, and other contacts.
- Building a *network of contacts* for research opportunities, finding sponsors, reaching fellow specialists; thus the development of a *Personal Research Network* (PRN) is appropriate not only for 'establishing professional expertise' but also for 'professional identity construction' (Gilpin, 2010).
- *Monitoring scientific events*: nowadays following conferences and posting from scientific events (with a special hashtag) is a common practice; communication before, during and after the event, using microblogging as official, quasi-official or unofficial back-channel, for collaborative keynotes, and feedback.
- *Scholarly publishing and capturing contextual information*.

Other studies suggest that the researchers' behavior changed due to the *social participatory process* in micro-sphere stressing the need to create an online research profile on microblogging, what we called a *micro-scholarly identity 2.0*.

4.6.4. Potential disadvantages

There are also some potential withdraws in using microblogging in educational settings, such as:

- can be too distracting (or at least too distracting for some students, like someone with autism, attention deficit disorder, chronic fatigue syndrome etc.);
- is a time-consuming task both for students and teachers who 'already have too many places to post messages or check for student questions/comments'[50];
- can be addictive;
- (sometimes) no social / educational value;
- teachers are being 'on-call' virtually 24-7 and students can intrude into his/her private life;
- in classroom situations is better to have a private account (also students have to be warning and encouraging their anonymity and thoughtful postings otherwise);
- 'creates poor writing skills and could be yet another classroom distraction's (Faculty Focus, 2011).

Regarding the research, the disadvantages, barriers or limits of integrated microblogging can be included into one of these categories:

50 As one professor put it, 'I have no interest in adding yet another communication tool to my overloaded life.' (Faculty Focus, 2011)

- *Ethical dilemmas*: authority; coping with a large amount of information; the level of acceptability to collect, archive and analyze data from the stream; 'authenticity of crowd sourced information' (CIBER, 2010); intellectual property rights; new forms of peer review and approval, such as retweeting (for e.g. resending messages without giving credit); social citation sharing; trust etc.
- *Concerns about quality:* quality of ideas / information / assurance (poor studies, no substantial academic / scientific values; banality); drain on resources; too time consuming; reliability and expertise of microbloggers; disorganized information (sometimes a chaotic stream); common language (the human chemistry is all adrift); poor linguistic conventions (for e.g. difficulty of writing a math formula); limited communication options (short messages - only the length of a SMS); week feedback etc.
- *Security and privacy concerns:* information overload; noise; spam; juxtaposition with the personal life; confusing in following too many interactions; uncertainty of the identity of sender; plagiarism, lack of a code of microblogging ethics etc.

In order to actually reach the previously mentioned results and to limit the bad points, a well planned usage of microblogging in the teaching-learning process we suggest as necessary: the description of educational objectives, the orientation of education according to certain concrete landmarks, the construction of efficient learning situations, the planning of adequate evaluation tools.

4.6.5. Challenging advantages

Our previous experience (Holotescu and Grosseck, 2010) in integrating microblogging in the academic courses enabled them to notice the following aspects related to students:

- Development of written communication skills and especially multimedia skills (in a variety of forms and contexts).
- Creativity and intellectual curiosity – openness and receptivity to the new, communicating ideas, different perspectives on current technological reality (and not only).
- Information and media skills – creating information in various forms and environments.
- Since students are offered managerial attributions in connection to their own learning, the degree of their personal and social responsibility is thus improved.
- Capacity to adapt.
- Development of critical and systemic thinking.
- Demonstration of interpersonal and collaboration skills – through team-work, adapting to various roles and responsibilities.
- Identifying, creating and solving issues.
- Auto-formation – during courses we noticed the maintenance of a competitive spirit among participants.
- Entertainment (as a function of sensory stimulation). It is known that each online learning activity should include an entertaining component, which also facilitates learning in the real-world context.

On the other hand, the benefits of using microblogging for research purposes can be clustered in the following types:

- *Collective Intelligence*: communication; collaboration with a wider audience of specialists, sharing ideas and perspective, interdisciplinary research; collecting / surveying / filtering data and resources.
- *Ambient Intelligence:* visibility and validation of projects, results, professional portfolio, recognition.
- *Extension of the PRN – Personal Research Network*: building and engaging (in) a relevant community of scholars / of practice, beyond geographical, cultural and linguistic barriers; mentoring colleagues; transfer of knowledge between researchers; help in problem solving; build networks to support research (and researchers' career); access to OERs and collaborative applications.
- *Managing the researchers' projects*: research publishing; tagging contents; getting notified using RSS feeds.
- *Developing as a researcher:* improving digital and professional skills and competencies help for academic career.

4.7. Conclusions

Microblogging is here to stay: as an effective tool for professional development and for collaboration with students and peers, that can change the rules of the teaching-learning process and models good pedagogy responsive to student's learning needs and challenging teachers to revisit their roles as educators. It also incorporates innovative characteristics or allows for mash-ups identified by the Horizon Report 2012 as emerging technologies likely to have a large impact over the coming three years in education around the globe: cloud computing, mobile and tablet computing, social reading, adaptive learning environments or augmented reality (NMC Horizon Report, 2012).

For the time being, microblogging is a source of intellectual optimism, a fact of life, which will increasingly become a fact of learning at all ages and levels of education. Thus, the current debates on whether or not to introduce microblogging into (higher) education are useful but ultimately worthless without experience, creativity and innovation – the desire to think of the educational process in completely new terms. We also hope that the present chapter represents an invitation to future reflections and studies for reviewing, expanding and validating the theoretical basis of using microblogging by all educational actors.

The existing open/general microblogging platforms such as Twitter or Identi.ca offer the characteristics of communication/collaboration and ePortfolio visibility, but those for courses' privacy or history (groups) are missing.

The educational microblogging platforms such as Edmodo or Twiducate, which integrate group and LMS features, do not offer the possibility to interact with external experts, nor to built a public PLE.

As part of the first phase of the DBR approach (Figure 2.3), the features, architectures and educational usages of the platforms highlighted in this chapter are used in formulating the requirements of the educational platform, presented in Chapter 6, for mapping the proposed Open Learning Environment model.

4.7.1. Contributions

A comprehensive analysis of the features, uses and architectures of educational microblogging platforms was presented in this chapter and published in (*Holotescu* and Crețu, 2013).

Chapter 5. Emerging Technologies in Romanian Higher Education

5.1. Introduction

As part of the first phase of the DBR approach (Figure 2.3), the aims of the study presented in this chapter are:

- to gather information on ways in which Romanian academic staff are adopting new educational technologies and applications;
- to find out best usages;
- to identify expected features;
- to examine policies related to new technologies use in Romanian education.

The findings have been considered in formulating the requirements for the educational platform, presented in the next chapter.

5.2. Research Methodology. Objectives and questions

To ensure these objectives are met, the following research questions are proposed:

- How faculty members use new educational technologies/Social Media as reflective and collaborative teaching and learning tools, also for research and professional development?
- Which are the potential benefits, challenges, and disadvantages in using new educational technologies/Social Media in universities?
- Which is the relation between these technologies and mobile learning?
- How the usage can be extended, is there a need for training the educational actors in this topic?

- **Method**

For collecting the necessary information, we conducted an online questionnaire, publicized via academic networks of the university, relevant academic mailing lists and personal learning networks.

Data collecting was performed between the end of February and the beginning of March 2012, with 79 respondents/answers, after validation. Because only a few people from our networks re-send the link to the questionnaire, it was difficult to calculate the response rate.

5.3. Summary of findings

a.Respondents profile

Based on the findings obtained from the sample group we'll begin with basic information about respondents' profile. *Who are they?* By gender 41 are male (52%) and 38 female (48%). By age the higher percent is allocated to the population between 36-45 years old (37%) 43% having less than 35 years.

Table 5.1. Distribution of respondents by age

7 individuals (9%) were less than 25 years of age
27 (34%) are between 26-35 years
29 (37%) of them were between 36 and 45 years old
11 (14%) are between 46-55 years and
only 5 of them were older than 55

What is their academic profile? What is their role in higher education?

We managed to attract a wide variety of respondents at different stages of their academic careers:

- Professor – 5% (4);
- Reader – 15% (12);
- Senior lecturer – 19% (15);
- Junior lecturer -14% (11);
- Researcher 5% - (4);
- Professor doctorate coordinator - 1% (1);
- Academic administrator/Faculty development 4% (3);
- Other - 36% (29).

Where „Other" includes respondents who are in non-academic positions such as librarians, admission officers, trainers/instructors, doctoral candidates or master students, etc.

While at first glance the results suggest that the categories were not comprehensive enough, we tried to cover all disciplines ranging from mathematics to medical sciences:

- almost half of the respondents (43%) aligned themselves with the exact sciences disciplines (i.e. mathematics, physics, biology, informatics, engineering, earth sciences),
- 24% (19) identify themselves as aligned with a discipline of social sciences (psychology, education, social work, political sciences),
- 13% are related with medical domain,
- 8 persons are humanistic oriented (foreign languages, philosophy, journalism, law) and
- only 8% are in the economic area (management, marketing, human resources, public relations, administrative issues etc.).

We didn't take into consideration some demographic characteristics such as: how many years a member staff worked in higher education, the type of institution (college/university, public or private), size of the organisation, tuition / without fees etc. - these issues will be addressed and detailed in a future research.

b.Social Media accounts profile

A second group of questions collected data about the specific Social Media platforms on which the respondents are active, how they use them and what are the benefits and limits encountered.

On most Social Media platforms:

- 90% of users are passive lurkers who never contribute,
- 9% are active lurkers who reshare or comment,
- while only 1% are content creators or co-creators (Nielsen, 2006).

Do Romanian educational actors follow this *Social Media Engagement Rule*?

The question *„How do you use the following Social Media?"* refers to the use

only for documentation or also for content creation of a large area of networks and Social Media platforms. The analysis of these large categories, constituting an original classification of Social Media networks and applications presented in Chapter 3, makes an important difference between our investigation and other studies (Faculty Focus, 2011; Moran et al., 2011).

Table 5.2. Social Media Usage

Social media networks and applications around content used for	**Documen-tation %**	**Post notes/ content %**	**Not a user %**
Blog (Blogger, WordPress, weblog.ro)	22	44	34
Miniblog (Tumblr.com, Posterous.com)	14	6	80
Microblog (Twitter.com, Cirip.ro, Plurk.com, Edmodo.com)	19	29	52
General Social Networks (Facebook.com, Plus.Google.com, MySpace.com)	10	68	22
Professional Social Networks (LinkedIn.com, Xing.com, Academia.edu, Researchgate.net, Mendeley.com)	28	48	24
Social Bookmarking (Delicious.com, Diigo.com)	10	23	67
Video sharing (Youtube.com, Vimeo.com, TED.com, TeacherTube.com, Trilulilu.ro, MyVideo.ro)	46	43	11
Image sharing (Flickr.com, Picasa.Google.com, deviantART.com)	29	49	22
Audio/Podcasting sharing (Blip.fm, SoundCloud.com)	10	10	80
Presentation sharing (Slideshare.net, Authorstream.com, Prezi.com)	22	39	39
Document/Books sharing (Scribd.com, DocStoc.com, Docs.Google.com, Books.Google.com)	32	56	13
Mindmaps (Mindomo.com, Mindmeister.com, Spicynodes.org)	6	18	76
Screencasting (Screenr.com, ScreenJelly.com, ScreenCastle.com)	4	13	84
Livestreaming (Qik.com, UStream.com)	6	9	85
Feeds Monitoring (Reader.Google.com, Bloglines.com)	24	24	52
Wiki (Wikispaces.com, MediaWiki.org, Wikia.com, PBWorks.com)	44	34	22
Digital storytelling (Voicethread.com, Glogster.com, Capzles.com, Notaland.com, Storybird.com, Storify.com, Photopeach.com, Projeqt.com)	0	15	85

Almost all respondents are aware of the large categories of platforms, for documentation only or also to post notes/content (Table 5.2). The most popular seems to be those for multimedia content sharing:

- video – 89% of responders declared that they use such platforms,
- documents/books - 88%,
- image – 78%,

and in all cases at least half post content.

The large interest for the documents/books sharing (88%) and presentation sharing platforms (61%) has confirmed the social reading trend in the 2012 Horizon Report in higher education. However, we can note that the platforms for podcasting and audio sharing are at the opposite pole of interest – only 20% of respondents use them.

More than two third are active on wikis (78%), general networks (78%), professional networks (76%) and blogs (66%), and half of them post content on these platforms, the highest rate of postings being on general networks (68%).

Half of respondents (48%) monitor feeds to keep track of news and activate on microblogs. As one of the most important usage of microblogging is for news searching - 56% (Grosseck and Holotescu, 2011b), the micro-posts streams can be seen as curated feeds, containg news, but also comments and validation. Only 20% pay attention on miniblogs (such as Tumblr and Posterous).

Even if with very interesting and challenging uses, such as collaborative work on scenarios, tutorials and micro-lectures, the educators show a low interest on mindmapping (24%), screencasting (16%) or digital storytelling platforms (15%). An explanation could be the fact that to use such platform you need to be and keep informed, to activate in online communities where to learn and share ideas and experiences.

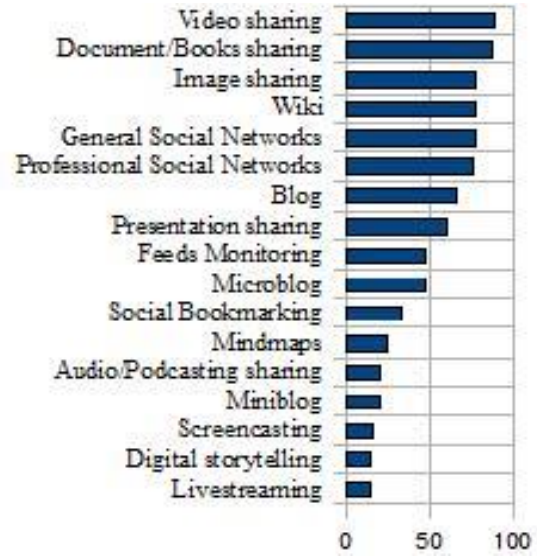


Figure 5.1. Users of Social Media platforms

Calculating an average for all the platforms, we can affirm that 31% of respondents create content, a percentage much higher than 9% for active lurkers and 1% for creators. But before concluding that the Romanian educational actors are breaking the *Social Media Engagement Rule* (Nielsen, 2006), we should not forget that the questionnaire responses were received from active users who wanted to get involved in this research approach.

Table 5.3. Platforms for Communication/Collaboration/Location-based

Do you use the following Social Media for communication/collaboration/location-based?	**Number**	**Percent**
Groups (Groups.Google.com, Groups.Yahoo.com, Ning.com, Meetup.com)	71	**90**
Forums/Spaces for discussions(phpBB.net, Quora.com, Disqus.com)	26	33
Location-based (Foursquare.com, Yelp.com, Zvents.com)	8	10
Augmented reality (Layar.com, Wikitude.com, Zooburst.com)	6	8
Virtual worlds/Social Games (Secondlife.com, Playdom.com, OpenSimulator.org)	7	9
IM (YM, GTalk, Jabber, Skype)	53	**67**

If the groups or IM tools, which can be considered as Web 1.5 applications, are used by a large majority (90% and 67% respectively), the new discussions applications, such as Quora or Disques, appear familiar for only 33% of respondents, location-based for 10%, augmented reality (AR) for 8% and virtual worlds/social games for 9%. This figures can be correlated with the issue that the experience in integrating such tools in education is lower, also with the fact that the applications for location-based and AR are mobile – we'll see that a relative low percentage of educators use mobiles or tablets/ipads.

At the question *„What other Social Media tools/categories do you use?"* even if only a few answers were received, they are very interesting and worth to be mentioned: collaborative graphs and infographs, desktop sharing applications (BeemYourScreen), eLearning platforms (Moodle, Sharepoint) with Social Media features, platforms for social learning (Schoology), for project management (Basecamp), or for software engineering (GitHub).

Table 5.4. Are the following statements true for you?

Statements related to Social Media	**Yes (%)**	**Not yet, but I'm aware of it (%)**	**No (%)**
I access Social Media via mobile	46	27	28
I access Social Media via tablet / ipad	15	48	37
I evaluate the activity of my students on Social Media platforms	30	27	43
My institution assesses my activity on Social Media platforms	15	24	61
My institution encourages/supports the usage of Social Media by teachers/students/pupils	34	30	35
My institution has specific policies related to Social Media usage	15	37	48
I became familiar with SM during a course/ workshop/ project	30	4	66

Almost half of the respondents access Social Media platforms using mobile phones, while only 15% are equipped with tablets / ipads. A third (28%, respective 37%) seems not to be interested in using mobiles or tablets / ipads for this purpose.

The percentage of teachers (30%) who evaluate the activity of their students on Social Media platforms is very close to that of teachers (34%) coming from institutions which encourage and support the use of Social Media by teachers/students/pupils. However, we can note that the institutions of only 15% of responders assess their activity on Social Media platforms or have specific policies related to Social Media usage.

Even if only one third of educational actors became familiar with Social Media during a course, workshop or project, a very low percentage (4%) are interested to participate in such a training.

c.Practices and reasons for Social Media usage

A breakdown of educational actors awareness in using Social Media in different activities appears in the following table.

Table 5.5. Do you use Social Media for the following activities?

Activities	Yes – I have used	Not yet, but I'm aware of it	No
didactical activities	61%	18%	22%
research activities	58%	20%	22%
professional development	**78%**	**11%**	**10%**
personal development	**78%**	**8%**	**14%**

The greatest percentage (78%) are using Social Media for professional and personal development, while high percentages are also for those who use such tools for didactical activities (61%) and research activities (58%). We can say that there is a true adoption of Social Media in all the domains of the educational process, the rate being much higher than that concerning only the specific technology of microblogging (Freire and Brunet, 2010).

The survey showed there is a relative small group of educators (10-22%) who believe that Social Media has no place in education.

Regarding the mode of communication and collaboration (*„At which level of communication and collaboration do you use Social Media?"*) we see that Social Media are a medium used at all levels, with peers from their own country or abroad, by around two third of responders. Again the percentages are much higher than those for microblogging, which still has a narrow adoption (Grosseck and Holotescu, 2010), the same note is available for the next question too. What seems surprising here is that the lower level of own department/faculty (with the highest f2f interaction) is the one where Social Media tools are highly used, by 77% of responders.

Table 5.6. Levels of Communication/Collaboration

I work with …	Number	Percent
Peers from different institutions from Romania	52	66%
Collaborators in different institutions from other countries	47	59%
Colleagues / peers across my university / institution	49	62%
Peers and Doctoral and Master students of my own department / faculty	61	77%

The following table includes what our study have been revealed regarding the most common types of uses of Social Media by scholarly community.

Table 5.7. Contextual conditions in which scholars use Social Media

Activities	Number	Percent
Searching news, academic content	70	89%
Dissemination of own results, articles, projects, presentations	49	62%
Inquiring/research (reviewing literature, collecting/analyzing research data)	52	66%
Personal / Professional Communication / Collaboration	65	82%
Networking for professional development	36	46%
Building a community of practice	24	30%
Building a learning community with students enrolled in formal courses	30	38%
Participating / following different scientific events (as a real time news-source)	52	66%

The findings indicate that Social Media usages by educational actors are:

- *Search for scholarly content* - the highest percentage of responders (89%) are looking to discover news, ideas, experiences, articles and projects.
- *Dissemination channels* for promoting own results / articles / projects or presentations - appreciated as being powerful by 62% of respondents.
- 66% say that Social Media tools are important in *reviewing the literature*, *collecting and analyzing research data.*
- *Sharing professional experiences online*, communicating scholarly ideas, collaborating with peers or with networks of stakeholders are favorite activities for 82% of users.
- Building a *network of contacts* for research opportunities, for finding sponsors or for reaching fellow specialists was indicated by 46% of the responders.
- Less than one third (30%) appreciate the power of sharing, skills development or knowledge creation by building *communities of practice*.
- A percentage of 38% shows a low interest in building *learning communities*, student centered. Thus we can say faculty members are (still) unprepared to integrate Social Media in their courses.
- Nowadays *following* presentations, livestreamings, videos and posting from *scientific events* is a common practice, adopted by two third of responders (66%).

The questionnaire has also two open-ended questions asking respondents to list / to identify main advantages and constraints to uptake when using Social Media in higher education. Almost all the respondents share their impressions, which ranged from positive general comments to negative remarks, like „I think Social Media are very useful for communication and collaboration" to „I just don't get it".

Although Social Media redefines the relation between technology and education, using it in academic courses does not represent an easy teaching / training / researching and learning method. It implies a sum of efforts, and especially knowledge of these technologies, with both benefits and limits.

Advantages expressed by participants (some of them are listed in the respondents own words):

- *accessibility and ease of usage* (anyone can create a blog or a YouTube account in just a few minutes), including mobile Social Media devices and

applications (smartphone, tablets, qr-codes, augmented reality etc.);
- *cost reduction* (low educational marketing costs) – most Social Media sites offer access to services, information and the community free of charge;
- *flexibility, transparency and autonomy of applications*;
- *educational „recruit ability"* in social networks; the results support what (Barnes and Lescault, 2011) study documented: higher education institutions are using especially social networking sites, not only to recruit but to research prospective students;
- *changing teachers' attitudes* towards using Social Media in academic courses (taking academics out of their usual comfort zone);
- *engaging / enriching / empowering students' interactions and participation* through the use of Social Media in academic environments;
- *collaborative characteristics / features* which erase the barriers between formal and informal/non-formal learning;
- *establishing relationships and conversations* among teachers, students, professionals, researchers from different institutions;
- *facilitating learning* through personal learning networks / environments (peer-to-peer learning and mentoring);
- *social interactions* in communities for learning, practicing, as well as professional ones (learning from experts and peers);
- *teaching / learning digital skills* like creation, curation and sharing online/digital content/knowledge;
- *easily-accessible creativity* / accumulative information;
- *„use of authentic study materials*", some of them in real-time (i.e. microblogging is an easy way to engage in dialogues with anyone, for instance);
- a non-conformist and flexible academic environment (*„easy socialization"*);
- facilitating the processes of providing information, of building knowledge (*„a modern approach of educational subjects*");
- *feedback* (one can receive ideas, suggestions and opinions from mere visitors, one can update the strategy or educational services, or improve the course);
- *easy monitoring online presence and reputation*;
- *collaborative participation* - developing research projects at distance;
- using *open education* in terms of: open source / free software, open educational resources, open content, open access publication, open teaching, open scholarship.

Almost all of the respondents highlighted barriers or limits of using Social Media in higher education. Based on their responses, it appears that most of the comments are related to the following **disadvantages:**

- *content trivialisation* caused by a lack of validation procedures (the crowdsourcing effect);
- *security of data and persons*;
- *aggressive / mistrusted / unfiltered information flows*;
- *online information / cognitive overload,* advertising interference, informational abuse, spam, disorientation, infoxication, fragmentation etc.;
- *equality or e-quality* (anyone can publish web content, but not everyone offers quality content; unsolicited content);
- *neglecting the educational goals* / purposes / social limitations;
- *difficult management of digital identity / anonymity*: fake IDs and hiding one's real identity have been and will continue to be issues;

- *ethical concerns:* proper professional behaviour in the use of Social Media: confidentiality, defamation, following university regulations / the academic Social Media policy;
- *institutional norms* / terms of use and best practices in the field, disadvantages policies for educational sector (i.e. in Romania there are no academic clear rules regarding the use of social web tools in education; there is also a need to have a unique platform for the entire university / professional staff);
- *time spent on Social Media sites*: all things require time and dedication, and Social Media entails online presence, dialogue and sustained activity;
- Social Media also requires *a certain life style and/or an organisational culture* in the digital era;
- *emotional barriers*: perceptions of technology, anxiety related to its use, lack of confidence in their potential and negative personal experiences related to technology;
- *artificial communication*: written communication vs oral communication (online vs f2f);
- *the noise* , pseudo-relationships, in-appropriate reactions, personal exposure etc.;
- *the activity with / within Social Media isn't recognised as academic* (more specific – it doesn't count in periodic assessment, also lack or rewards for those who use new tools).

For the time being, we can say that only a few universities have adopted coherent strategies for the pedagogical integration of social web functions and the development of the best methods for teaching and learning based on these. Thus, for a more accurate picture of Social Media landscape in academia it is necessary to repeat the study at least for several years to provide a longitudinal look at adoption of Social Media by colleges and universities.

To summarize: *Could Social Media be a main communication / collaboration / sharing channel in the Aula? Or does it rank low among other online applications/platforms? Do we know which Social Media tools / applications are most used by faculty members? Which are the most popular within teachers' communities? And how are they used:* for continuous exchanges of information with their target audience? for communicating? for obtaining feedback on students or research projects? for increasing the notoriety of study or training, as well as scholarships? for other competitions, campaigns, non-profit events / fundraisings, volunteer activities, promoting university missions etc.? These are topics that need to be further explored.

It is also necessary to build online communities for professional learning, academic practice, quality and leadership for managers of institutions, as well as for the people involved in both teaching and administration. There should be more Social Media platforms dedicated to communities of education experts (policies, foresight, etc.), there should be an institution-wide *Social Media Observer* that strengthens university policies related to Social Media at the level of the higher education institution and that represents, at the same time, a landmark for the strategic positioning of universities within the new technological landscape.

However, an informal Social Media educational platform, functioning in conjunction with the official platform, will not only become an extremely efficient communication channel, but will also emphasize the culture of the students and that of the staff of the institution in question. The most important type of feedback will continue to be interactivity.

5.4. Conclusions

Despite Social Media popularity among staff (Merrill, 2011) and of the predominantly positive perceptions of it among higher education institutions, the use of Social Media „does not come easily" (Harris and Rea, 2009) and is still at the level of experimentation, as it is trying to find its place in the online environment.

In the meantime, Academia must free itself from its fears, prejudices and arrogance. In order for this to happen, the management of higher education institutions must change, firstly by acknowledging the need to have a Social Media presence, and then by providing clear regulations regarding its use (private life, protecting intellectual property, etc.). It is also important to recognize the importance of Social Media in the recruitment of students, dissemination of research and brand building (alumni included), as an engagement tool and not as a megaphone (Colvin, 2011). Furthermore, we need assigning Social Media responsibilities within faculties and departments. Thus, the organisational charts of our institutions should include „new" positions such as: learning architect, learning / Social Media community manager, serious game designer or learning autonomy counselor (Grosseck and Holotescu, 2011a).

Perhaps the most significant approach of using Social Media in universities is the fact that it is more a socio-cultural phenomenon, rather than a technical one, an attitude rather than a sum of technologies, the fact that it has become more personal to the students, emphasizing the development of communities of learning and practice and the strength of something done together.

We can conclude also that there are needed:

- policies related the use of new educational technologies in education
- teacher training in using emerging technologies
- online spaces for students / teachers / practitioners to share learning scenarios.

The integration of different SM platforms into OLE could bring solutions for the above last two issues.

The conclusions are important in depicting the requirements of the educational platform.

5.4.1. Contributions

The study on the usages, challenges and policies regarding the integration of emerging technologies in Romanian education, for teaching, learning and professional development is the original contribution of this chapter, being the first with this topic in the country. The results were published in (*Holotescu* and Grosseck, 2012).

Chapter 6. Requirements analysis for an educational multimedia microblogging platform

6.1. Introduction

In order to establish the set of features needed for the platform architecture, as part of the second phase of the DBR approach (Figure 2.3), we have realized a study of Social Media platforms and applications, comparing the content creation/sharing and communication/collaboration functionalities they offer. After identifying the most innovative characteristics and discussing how they can be improved, a set of requirements for the educational platform is generated.

The study includes:

- 6 microblogging platforms used in education, already described before: Twitter, Edmodo, Plurk, Identi.ca, Yammer and Twiducate;
- 23 categories of Social Media networks and applications, covering the current Social Media landscape (Solis and JESS3, 2010) and educational tops (Hart, 2014), presented in Chapter 3 and 5:
    - 17 categories for content sharing
    - 6 categories for communication/collaboration/location-based.

6.2. Identifying the functionalities of Social Media platforms

The list of 25 functionalities we have identified for our study is the result of the direct work/test of the platforms and of consulting similar studies:

- Pistachio Consulting (2008) realized a study of 19 enterprise microsharing applications, using a number of 19 criteria, while
- the study of (Smith et al., 2012) considered a set of 15 types of Social Media applications, based on 8 capabilities.

Below the identified functionalities are briefly described:

1. Software License (proprietary/OS) – application is proprietary or Open Source;
2. Hosting – application directly hosts the (multimedia) content or only embeds it;
3. Tagging – support for content classification using tags;
4. Groups (Private/Public) – support for user groups;
5. (Nested) Comments – support for comments chronologically or hierarchically (nested) organized;
6. Access to group documents – support for group users to access group (common) documents;
7. Private posts – posts visible only to owner (and to friends);
8. Private profile – profile visible only to owner (and to friends);
9. Public profile/portfolio/stream – support for building a public profile with the activity on the platform;
10. Direct/Private Messages – support to send direct/private messages to other users;

11. Resend (Retweet) – possibility to resend a post of another user, which will appear in the own stream;
12. Feeds – platform provides feeds for different streams (users, groups);
13. Statistics – statistics and visualisations for users/groups activity;
14. Multimedia objects – the possibility to post multimedia content: video, audio, images, presentations, files, etc., marked below with v a i p f;
15. Monitor Web/e-mail/SMS/API/Feed/IM – a user can monitor messages/content via the online interface/e-mail/SMS/API/Feed/IM, marked below with w e s a f i;
16. Post Web/e-mail/SMS/API/Feed/IM - a user can monitor messages/content via the online interface/e-mail/SMS/API/Feed/IM, marked below with w e s a f i;
17. Location – user location is identified and posted (checked-in);
18. Users/Resources Recommender – support for similar user and/or interesting resources recommendation;
19. Mobile Interface – application provides an interface for mobiles;
20. API – application provides an Application Programming Interface (API);
21. Import/ Export notes (re-sharing) – support for import/export content from/to other applications;
22. Need confirmation for follow – in order to monitor other users' stream, their confirmation is needed;
23. Surveys – support for creating surveys/polls;
24. Collaborative editing – possibility to edit content collaboratively;
25. Share/discuss Learning Design – support for share/discuss content (formalization) related to Learning Design.

6.3. Comparing Social Media platforms

Table 6.1. Social Media Platforms Comparison (a)
Legend: online interface – w, e-mail – e, SMS – s, API – a, Feed – f, IM – i; multimedia content: video - v, audio - a, images - i, presentations - p, files - f; the functionality is present +, is not present -

	0	1	2	3	4	5	6	7	8	9	10	11	12	13
0	**Platform**	Software License (proprietary/OS)	Hosting	Tagging	Groups (Private/Public)	(Nested) Comments	Access to group documents	Private posts	Private profile	Public profile/portfolio/stream	Direct/Private Messages	Resend (Retweet)	Feeds	Statistics
a	**Microblogging Platforms**													
1	Twitter	P		+	lists	+			+	+	+	+	+	+

2	Edmodo	P	+	+	+	n+	+	+	+		+	+	+	+
3	Plurk	P		+		+				+	+	+	+	+
4	Identi.ca	OS		+	+	+				+	+	+	+	+
5	Yammer	P	+	+	+	n+	+	+	+		+	+	+	+
6	Twiducate	P			+	+	+	+	+		+			+
b	**Social Media networks and applications for content sharing**													
1	Blog (Blogger, WordPress, weblog.ro)	P/ OS	+	+		+/-		+	+/-	+			+	+
2	Miniblog (Tumblr.com, Posterous.com)	P	+	+		+		+		+			+	+
3	General Social Networks (Facebook.com, Plus.Google.com, MySpace.com)	P/ OS	+		+	+	+	+	+	+	+	+	+	+
4	Professional Social Networks (LinkedIn.com, Xing.com, Academia.edu, Researchgate.net, Mendeley.com)	P	-/+		+	+	+	+	+	+	+	+	+	+
5	Social Bookmarking (Delicious.com, Diigo.com)	P/ OS		+		+		+		+	+	+	+	+
6	Video sharing (Youtube.com, Vimeo.com, TED.com, TeacherTube.com, Trilulilu.ro, MyVideo.ro)	P/ OS	+	+		+/-		+	+	+			+	+
7	Image sharing (Flickr.com, Picasa.Google.com , deviantART.com)	P	+	+	+	+/-		+	+	+			+	+
8	Audio/Podcasting sharing (Blip.fm, SoundCloud.com)	P	+	+		+		+		+			+	+
9	Presentation sharing	P	+	+	+	+		+	+	+			+	+

	(Slideshare.net, Authorstream.com, Prezi.com)													
10	Document/Books sharing (Scribd.com, DocStoc.com, Docs.Google.com, Books.Google.com)	P	+	+		+		+	+	+			+	+
11	Mindmaps (Mindomo.com, Mindmeister.com, Spicynodes.org)	P	-/+					+	+	+			+	+
12	Screencasting (Screenr.com, ScreenJelly.com, ScreenCastle.com)	P	+			+		+	+	+			+	+
13	Livestreaming (Qik.com, UStream.com)	P	+					+		+			+	+
14	Feeds Monitoring (Reader.Google.com, Bloglines.com)	P/ OS	-/+	+				+	+	+			+	+
15	Wiki (Wikispaces.com, MediaWiki.org, Wikia.com, PBWorks.com)	P/ OS	+					+		+			+	+
16	Digital storytelling (Voicethread.com, Glogster.com, Capzles.com, Notaland.com, Storybird.com, Storify.com, Photopeach.com, Projeqt.com)	P	+					+		+			+	+
17	Learning design (Cloudworks.ac.uk)	P	-	+	+	+		+		+			+	+
c	**Social Media for communication/collaboration/location-based**													
1	Groups (Groups.Google.com, Groups.Yahoo.com, Ning.com, Meetup.com)	P/ OS	+		+	n+	+		+	+	+/-		+	+

2	Forums/Spaces for discussions(phpBB.net, Quora.com, Disqus.com)	P/OS	+			n+			+	+	+/-		+	+
3	Location-based (Foursquare.com, Yelp.com, Zvents.com)	P				+			+	+			+	+
4	Augmented reality (Layar.com, Wikitude.com, Zooburst.com)	P												
5	Virtual worlds/Social Games (Secondlife.com, Playdom.com, OpenSimulator.org)	P			+	+			+	+/-	+/-			
6	IM (YM, GTalk, Jabber, Skype)	P/OS							+	+	+			

Table 6.2. Social Media Platforms Comparison (b)
Legend: online interface – w, e-mail – e, SMS – s, API – a, Feed – f, IM – i; multimedia content: video - v, audio - a, images - i, presentations - p, files - f; the functionality is present +, is not present -

	0	14	15	16	17	18	19	20	21	22	23	24	25
0	Platform	Multimedia objects	Monitor Web/e-mail/SMS/ API/Feed/IM	Post Web/e-mail/SMS/ API/Feed/IM	Location	Users/Resources Recommender	Mobile Interface	API	Import/ Export notes (re-sharing)	Need confirmation for follow	Surveys	Collaborative editing	Share/discuss Learning Design
a	**Microblogging**												
1	Twitter	v i p	w e s a f	w e s a f	+	+	+	+	+				

			i	i									
2	Edmodo	v a i p f	w s a f	w s a		+	+	+	+		+		
3	Plurk	i v	w s a f i	w s a i			+	+	+				
4	Identi.ca		w a f i	w a i			+	+					
5	Yammer	v a i p f	w e s a f i	w e s a f i			+	+	+		+	+	
6	Twiducate	v a i f	w	w			+				+		
b	**Social Media networks and applications for content sharing**												
1	Blog (Blogger, WordPress, weblog.ro)	v a i p f	w a e f	w a e f			+		+				
2	Miniblog (Tumblr.com, Posterous.com)	v a i	w a e f	w a e f			+		+				
3	General Social Networks (Facebook.com, Plus.Google.com, MySpace.com)	v a i p	w a f	w a f	+/-	+	+		+	+	+		
4	Professional Social Networks (LinkedIn.com, Xing.com, Academia.edu, Researchgate.net , Mendeley.com)	v a i p	w a f	w a f		+	+		+	+	+		
5	Social Bookmarking (Delicious.com, Diigo.com)		w a f	w a			+		+				
6	Video sharing (Youtube.com, Vimeo.com, TED.com, TeacherTube.com, Trilulilu.ro, MyVideo.ro)	v	w a f	w a			+		+				

7	Image sharing (Flickr.com, Picasa.Google.com, deviantART.com)	i	w a f	w a			+		+				
8	Audio/Podcasting sharing (Blip.fm, SoundCloud.com)	a	w a f	w a			+		+				
9	Presentation sharing (Slideshare.net, Authorstream.com, Prezi.com)	p	w a f	w a			+		+				
10	Document/Books sharing (Scribd.com, DocStoc.com, Docs.Google.com, Books.Google.com)	f	w a f	w a			+		+				
11	Mindmaps (Mindomo.com, Mindmeister.com, Spicynodes.org)	+	w	w			+		+			+	
12	Screencasting (Screenr.com, ScreenJelly.com, ScreenCastle.com)	+	w	w			+/-						
13	Livestreaming (Qik.com, UStream.com)	+	w	w			+						
14	Feeds Monitoring (Reader.Google.com, Bloglines.com)		w	w			+		+				
15	Wiki (Wikispaces.com, MediaWiki.org, Wikia.com, PBWorks.com)	v a i	w	w			+		+			+	
16	Digital storytelling (Voicethread.com	+	w	w			+/-		+				

	, Glogster.com, Capzles.com, Notaland.com, Storybird.com, Storify.com, Photopeach.com, Projeqt.com)												
17	Learning design (Cloudworks.ac.uk)	v i p	w	w									+
c	**Social Media for communication/collaboration/location-based**												
1	Groups (Groups.Google.com, Groups.Yahoo.com, Ning.com, Meetup.com)						+	+		+		+	
2	Forums/Spaces for discussions(phpBB.net, Quora.com, Disqus.com)	i					+/-		+	+			
3	Location-based (Foursquare.com, Yelp.com, Zvents.com)				+	+	+		+				
4	Augmented reality (Layar.com, Wikitude.com, Zooburst.com)				+	+	+		+				
5	Virtual worlds/Social Games (Secondlife.com, Playdom.com, OpenSimulator.org)						+/-		+	+			
6	IM (YM, GTalk, Jabber, Skype)	i					+		+	+			

One can note that usually the platforms are specific about the content that could be posted or shared (column 14). Also collaborative editing (24), access to common documents (6) or public/private groups (4), all being features that are important in educational contexts, are supported only by a few.

6.4. Requirements Specification

Table 6.3. Requirements Specifications
Legend: online interface – w, e-mail – e, SMS – s, API – a, Feed – f, IM – i; multimedia content: video - v, audio - a, images - i, presentations - p, files - f; the functionality is present +, is not present -

	0	1	2	3	4	5	6	7	8	9	10	11	12	13
	Educational Multimedia Microblogging Platform	Software License (proprietary/OS)	Hosting	Tagging	Groups (Private/Public)	(Nested) Comments	Access to group documents	Private posts	Private profile	Public profile/portfolio/stream	Direct/Private Messages	Resend (Retweet)	Feeds	Statistics
	Cirip	P	-	+	+	+	+	-	-	+	-	+	+	+

	0	14	15	16	17	18	19	20	21	22	23	24	25
		Multimedia objects	Monitor Web/e-mail/SMS/ API/Feed/IM	Post Web/e-mail/SMS/ API/Feed/IM	Location	Users/Resources Recommender	Mobile Interface	API	Import/ Export notes (re-sharing)	Need confirmation for follow	Surveys	Collaborative editing	Share/discuss Learning Design
	Cirip	v a i p f	w e s a f i	w e s a f i	**-** (future)	**-** (partial)	**+**	**+**	**+**	**-** /groups +	**+**	**+**	**+**

The capabilities we sought for our educational microblogging platform are presented in Table 6.3. The motivation for educational context are also given in Table 6.4, where the requirements of the microblogging framework as an open social network are mapped onto the features of the Open Learning Environment model defined in Chapter 3 (Table 3.5).

Table 6.4. Microblogging Platform characteristics mapped onto the features of an Open Learning Environment

Type	No.	Open Learning Environment Features	Microblogging Platform Characteristics
Pedagogical	1.	Open Educational Resources	14. Multimedia objects – the possibility to post multimedia content: video, audio, images, presentations, files, etc.; the platform is open to different (educational) social networks, the (little) Open Educational Resources hosted on these platforms become part of the Cirip flow; *Course content extended with Open Educational Resources / Open Access materials / MOOCs proposed by teachers, learners and/or automatically recommended.*
	2.	Learners as content co-creators	6. Access to group documents – support for group users to access group (common) documents hosted in the cloud, on Google Drive (extension for Dropbox to be implemented in future); 11. Resend (Retweet) – possibility to resend a post of another user, which will appear in the own stream, thus increasing the visibility/importance of that specific note/resource; 24. Collaborative editing – possibility to edit content collaboratively, the content being hosted in the cloud (Google Drive); 21. Import/ Export notes (re-sharing) – support for import/export content from/to other applications: Twitter, other networks via AddThis; importing notes on specific topics from Twitter, blogs, RSS feeds, thus enlarging a user profile or a group content with real-time information; *The content is not created solely by faculty members, but can be collaboratively co-created by students enrolled in that course.*
	3.	Collaborative/ distributed assessment; Learning Analytics	13. Statistics – statistics and visualisations for users/groups activity, basis for assessment and learning analytics; 23. Surveys – support for creating surveys/polls to be answered online or via SMS; *Peer and collaborative/distributed assessment have to be integrated, together with issues related to copyright, ownership, security and privacy; optimizing and understanding learning using data about learners.*
Soc	4.	Interactions with external	5. Comments – support for comments organized chronologically;

		learners and experts	7. Private posts – posts visible only to owner (and to friends) can be realized through private groups; 10. Direct/Private Messages – to send public direct messages to other user @username is specified; private direct messages can be implemented through a private group with this purpose, opened by the interested users; *The students' interactions with external learners and experts on different Social Media platforms could bring new insights on content and enlarge it, could validate the course content.*
	5.	Collaborative applications and platforms	*Note:* the platforms connected with Cirip are selected based on a few criteria and will be presented in Chapter 8; *Students choose and use different distributed (free) collaborative applications and platforms for their group/cooperative work, also for communication with external participants and experts.*
	6.	Public PLE	8. Private profile – profile visible only to owner (and to friends) can be realized through private groups; 9. Public profile/portfolio/stream – support for building a public profile with the activity on the platform; this way an ePortolio of the user activity is created; 12. Feeds – platform provides feeds for different streams (users, groups), making possible the monitoring from specific RSS aggregators; 15. Monitor Web/e-mail/SMS/API/Feed/IM – a user can monitor messages/content via the online interface/e-mail/SMS/API/Feed/IM; new mashups/applications can be created based on the provided API; 16. Post Web/e-mail/SMS/API/Feed/IM - a user can monitor messages/content via the online interface/e-mail/SMS/API/Feed/IM; *Students build public profiles/portfolios during courses, which can be extended/used in future courses; also their previous/tacit knowledge could be assessed for a better personalization of the course.*
	7.	Time-persistency/ Retrieval	3. Tagging – support for users' and groups' content classification and retrieval using tags; 4. Groups (Private/Public) – support for user groups is a very important feature for online/enhanced courses or collaborative teams, assuring the privacy, time-persistency, history/retrieval of all communication/collaboration; 22. Need confirmation for follow – in order to monitor other user stream, his/her confirmation is not

			needed; only to join a specific group if the facilitator of the group specifies this setting when creating the group; *The environments should be time-persistent (Mott and Wiley, 2009): an important aim would be to continue the collaboration between participants (and facilitator) after the course end, to maintain access at the course content and interaction, and to assure a continuity of the learning community. Also the content and interaction should be retrieved using different search terms.*
	8.	Teacher training/ sharing Learning Design	25. Share/discuss Learning Design – support for sharing/discussing content (formalization) related to Learning Design/scenarios for integrating new technologies. *Teachers should continuously learn/improve knowledge and skills in communities of practice, validate and improve learning scenarios, benefit of shadow mentoring from more experienced colleagues and be able to visit/learn from the virtual spaces facilitated by other peers.*
Technological	9.	Institutional/ administrative management features/ privacy assurance	*Note:* how groups implement the features of LMS is presented in Chapter 8; *A balance between imperatives of institutional networks and the promise of the cloud to be achieved (Mott, 2010).*
	10.	Mobile Learning	19. Mobile Interface – application provides an interface for mobiles, encouraging the mobile learning and collaboration; *Mobile learning is supported and encouraged: students can use mobile devices for a better management of their work (inside and outside educational institution).*
	11.	Others	1. Software License (proprietary/OS) – application is proprietary; 2. Hosting – application embeds the (multimedia) content, which is hosted in the cloud: on different (educational) social networks and on Google Drive, thus including (little) Open Educational Resources; 17. Location – user location to be identified and posted is a possible future extension; 18. Users/Resources Recommender – support for similar users and/or interesting resources recommendation implemented through searches, visualizations; 20. API – platform provides an Application Programming Interface (API);

Cirip allows the creation of a personal/public profile and/or portfolio including ideas, projects, research, information resources, multimedia objects

created individually or collaboratively.

From this perspective and according to classifications of Stutzman (2009), Cross and Conole (2009) and Engeström (2009), Cirip is both a *profile-centric* and a *social object-centric network* :

1. the objects are part of the communication-conversation flow of the platform;
2. the objects connect Cirip with other Social Media applications organized around educational objects;
3. objects can be reused, validated, created or recreated individually or collaboratively, thus Cirip offering the openness to Open Educational Resources – OERs;
4. *meta-objects* meaning *objects of learning design - LD* can be created; the *objects of learning design* specify learning scenarios, best practices for integrating new technologies (Cirip in particular) in education; Compendium scenarios can be imported to reach the experience of other communities of practice in LD;
5. by extension, public or private groups can be considered as *social objects*, functioning as sLMSs (social Learning Management Systems).

6.5. Conclusions

As part of the second phase of the DBR approach (Figure 2.3), the requirements for the educational microblogging platform are presented in this chapter, starting from an evaluation of the capabilities offered by a large typology of Social Media platforms, and from the conclusions drawn from the previous studies related to Social Media, emerging educational technologies and Microblogging. Arguments for educational contexts are also presented.

The requirements of the microblogging framework as an open social network are mapped onto the features of the Open Learning Environment model defined in Chapter 3.

6.5.1. Contributions

In this chapter we have proposed an original model of Open Learning Environment based on the microblogging technology; some results were published before in (*Holotescu* and Crețu, 2013).

Chapter 7. Platform Architecture and Implementation

7.1. Introduction

This chapter presents the architecture and implementation of the Cirip educational microblogging platform. Also its API, mashups and plugins are described here.

7.2. Technologies

The Cirip platform uses mainly open (source) technologies, which are presented in Figure 7.1. below. The platform is installed on an Apache server with PHP support, while the required database server is MySQL.

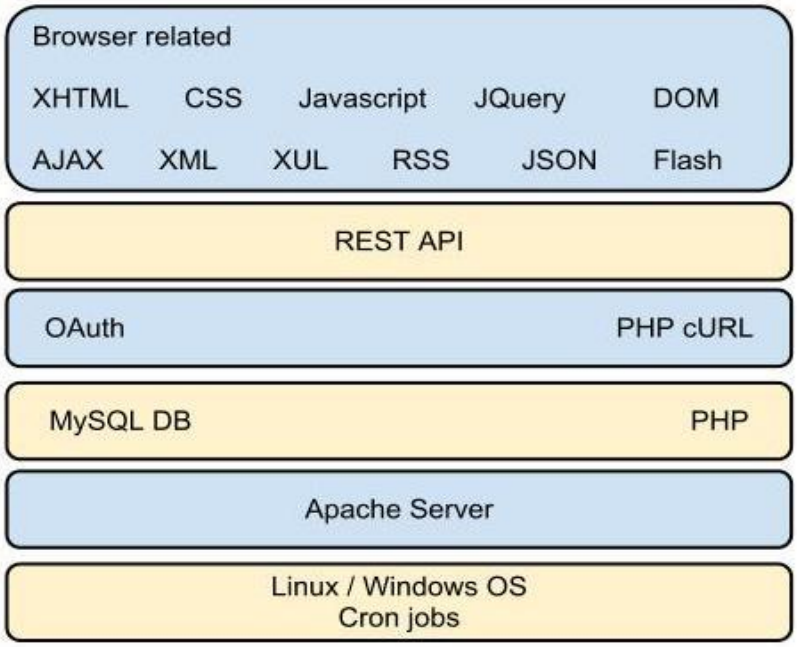


Figure 7.1. Technologies

7.3. Architecture

The Cirip platform has a centralised architecture based on the Model-View-Controller paradigm (Burbeck, 1992), having three layers concerned with behavior, activity, and data representation (Figure 7.2). This architecture gives the potential for multiple interfaces to access content. Also, the code structure is simplified by the

separation of behavior from content modelling (Bell, 2009). The Model layer persists across implementations, with the View layer changing depending on the type of device (mobile, IM, etc).

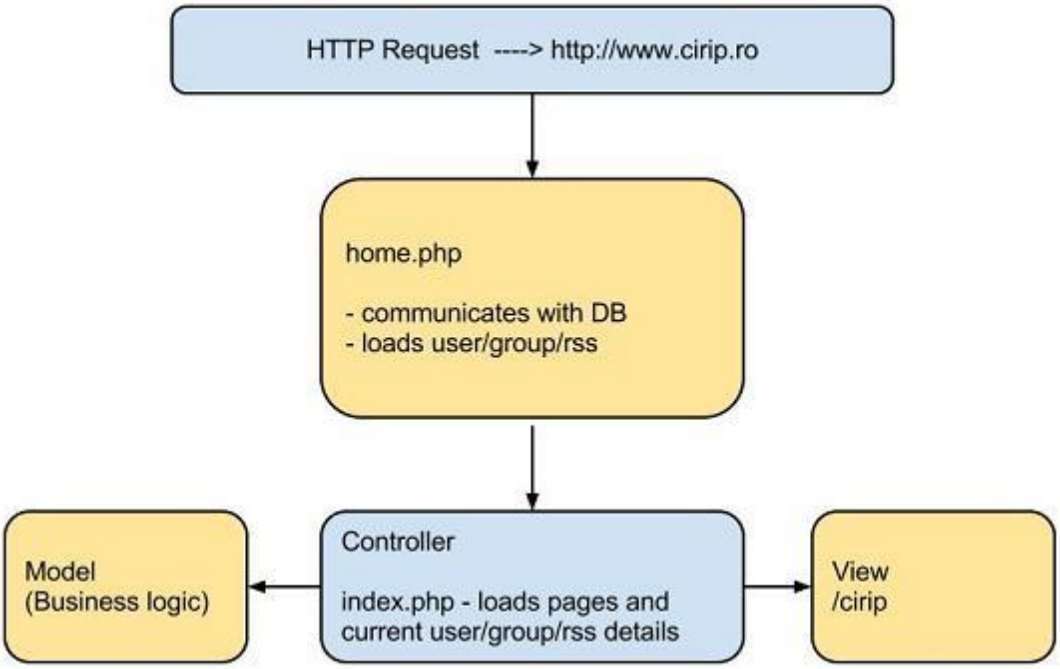


Figure 7.2. MVC Architecture

The platform components are depicted in Figure 7.3:

- *Authentication Module*: handles user authentication, integrating Twitter OAuth Authentication; this means that a user can access the Cirip platform with the account created on Cirip or with the account created on Twitter;
- *Status Sending Module*: supports the posting of messages on user or group timeline; it includes the *Status Parser* that will be described in subchapter 8.4.2;
- *Shorten Links Module*: this module deals with short links which are aliases of long links (URLS) and has three main functionalities:
  - for the RSS feeds monitored on the platform, each item of the original RSS is reduced to maximum 140 characters and contains a shorten link to the original item; the shorten link is created by the *Shorten Links Module* having a format like http://www.cirip.ro/l/xxxxxx; the correspondence between the original link and item name, and the random sequence xxxxxx is preserved in the table cirip_redirect;
  - when posting a message using the desktop interface, a link can be shorten using one of the services: sp2.ro, p.ly, url.ie, is.gd, tinyurl.com;
  - when a shorten link in a message is displayed in the desktop

interface, the original link is also listed, being returned by a function of this module.

- *Search Module* performs complex searches in the whole database for (not limiting the results to the notes sent during the last 2 weeks as Twitter did for a few years, since 2013[51]):
  - specific terms in messages:
    - sent by the user/group/feed of the current profile displayed in browser
    - all public messages
    - sent by the current user
    - sent by the followed users, groups or feeds;
  - users with characteristics (the results can be sorted alphabetically or based on the number of messages sent by the users):
    - specified string in their username or description
    - from a particular location
    - authored a specific type of microblog
    - specified gender
    - specified interface language (Romanian, English or German);
  - groups with characteristics:
    - specified string in groupname or description
    - having as moderator a specified user
    - specified visibility: public or private;
  - feeds with characteristics:
    - specified string in feedname or description;
- *Statistics/Visualisations Module*:
  - creates hierarchy for the tags posted in public messages (Top tags is listed for each Cirip page) and for tags contained by users/groups messages (listed on user/group profile page at Specific Tags)
  - manages the Network and Tagcloud sections of users/groups/feeds, and provides the Assessment tools which will be described in subchapter 8.6;
  - some of the statistics are created by cron jobs, the results being saved (cached) in specific MySQL tables, this way the access time to database is reduced;
- *Mobile Gateway*: assures the communication with mobile devices using the mobile interface (m.cirip.ro), the SMS messages and the specific mobile applications/mashups.

A user can send/monitor messages/content via the online/mobile interface, email, SMS, API, Feed, IM, and other plugins/mash-up applications.

[51] https://blog.twitter.com/2013/now-showing-older-tweets-in-search-results

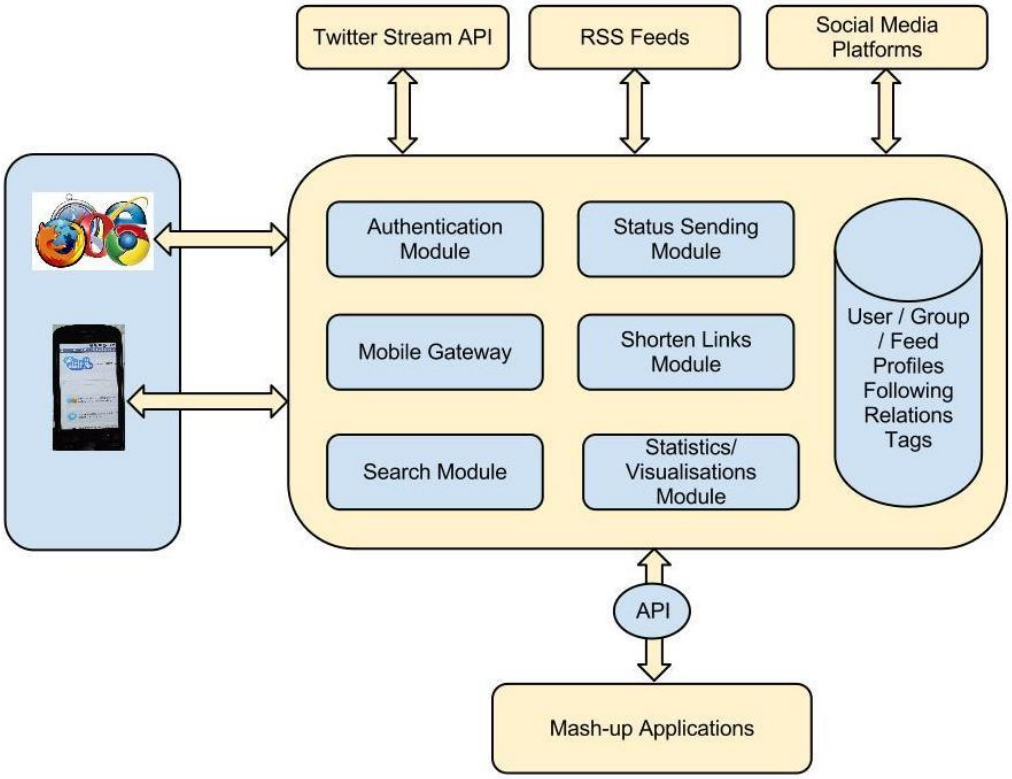


Figure 7.3. Platform Components

The platform content consisting in messages can be *enlarged* using:

- *Twitter Stream API*:
  - notes sent on Twitter can be imported in a user microblog if she/he selects the *twitter2cirip* option in profile settings; this way the user profile gives a better image of her/his online activities; we have to note here that the imported tweets are not directly addressed to other twitterers (they don't contain @user), but they are general messages for all the public;
  - Twitter notes containing specific terms can be imported in a group; the content of the group on a specific topic is enlarged with Real-Time information provided by Twitter on the same topic; the terms for *twitter2group* are specified by the group facilitator in group settings (*);
- *RSS Feeds* (to monitor RSS feeds, the Open Source Project Magpie RSS Parser[52] is used):
  - users can monitor RSS feeds they specify, the same they follow other users or groups; the RSS feeds can be provided by different sites/blogs or can be search feeds on topics/terms the user is interested in (*);

52 http://magpierss.sourceforge.net/

    - items of RSS provided by the site/blog authored by a user can be imported in her/his microblog if she/he selects the *rss2cirip* option in profile settings; again, this way the user profile gives a better/enlarged image of her/his online activities;
    - items of RSS provided by the site/blog authored by a group facilitator or items of a search feed can be imported in the group; again, the content of the group is enlarged with Real-Time information on a specific topic provided by other sites/blogs; the RSS is specified by the group facilitator in group settings at *rss2group* (*);
- *Social Media streams*:
    - users can embed in messages different multimedia/Learning Design objects from a large category of Social Media platforms; see subchapters 8.4 and 8.5 (*);
    - a FriendFeed widget on the user microblog shows her/his activity on other platforms, if she/he selects the *frienfeed* option in profile settings(*);
    - livestreaming created with *qik*[53] is displayed in a widget on the user microblog if she/he selects this option in profile settings(*).

Also the platform content can be *shared*:

- using the *RC resending mechanism* (part of *Status Sending Module*): any public message has a RC option – selecting it, the message will be resend by a user is her/his own timeline with the prefix RC @user, where user is the owner of the original message; this mechanism is a way to favorite/like/disseminate a message;
- using *Twitter Stream API*: notes sent by a user on Cirip can be exported on Twitter, if she/he selects the *cirip2twitter* option in the message form;
- *using RSS Feeds*: Cirip provides RSS feeds for each user/group timeline, for the public timeline, and also for the new users/groups/feeds created on the platform;
- *using Social Media streams*: the public messages can be shared on other platforms using the button + provided by the AddThis[54] plugin (*).

The options marked above with (*) are specific to Cirip only and are not supported by other microblogging platforms, a result of its architecture which is more complex than those of the common microblogging platforms (Cho, 2009).

The code is organized in the following main directories:

- /api – functions provided by API
- /ajax – functions called from Ajax
- /captcha – scripts for registration captcha code
- /chart – library for charts displayed for groups statistics
- /cirip – classes
- /cron – scripts called by cron jobs
- /grup – templates for groups
- /pro - templates for business groups
- /rss – scripts for RSS generation
- /sondaje - polls
- /utilizatori – scripts for user/profile management.

53 htttp://qik.com
54 http://www.addthis.com/

The following scripts function as cron jobs, being hosted in the /cron folder and scheduled to be executed periodically:

- cronrsssimplepie – imports RSS items for the feeds in DB that have subscribers
- cronnotify – send updates via SMS for users who monitor users/groups/feeds by SMS
- cronupdatemap – recent public messages are published on the map section[55] of the platform, using Google Maps API
- crontwitter2cirip – notes from Twitter account are imported for users who selected this option in profile settings
- cronmail2cirip – messages received at bot@cirip.ro are imported for users who sent them from the account specified in profile settings
- cronrss2ciripgroupsimplepie - imports RSS items in groups
- crondeleterss – old feeds items are deleted
- crontagshourly – tags statistics for user/group messages are updated hourly
- cronnewsletter – send newsletter to users who selected in profile settings to receive such notifications
- crondeletecache – delete cache
- crontwittersearch2cirip – notes containing specific terms are imported in groups from twitter
- status_snd.php – used for sending SMS.

7.4. Database

The MySQL database contains 36 tables (Figure 7.4) with relations depicted in Figure 7.5.

cirip_api_requests	cirip_redirect	cirip_importer	cirip_status_status_keyword
cirip_cauta	cirip_sessions	cirip_invitatii	cirip_tags
cirip_comune	cirip_sessionvars	cirip_location	cirip_tags_status
cirip_direct_messages	cirip_sms	cirip_location_city	cirip_test
cirip_domeniu	cirip_sondaj	cirip_location_country	cirip_twitter
cirip_events	cirip_sondaj_variante	cirip_log	cirip_users
cirip_firefox	cirip_sondaj_vot	cirip_newsletter_queue	cirip_users_bk
cirip_following	cirip_status	cirip_newsletter_queue_bk	cirip_users_twitter
cirip_googlemaps	cirip_status_keywords	cirip_notification	cirip_users_twitter_stats

Figure 7.4. Database tables

55 http://www.cirip.ro/cirip/map

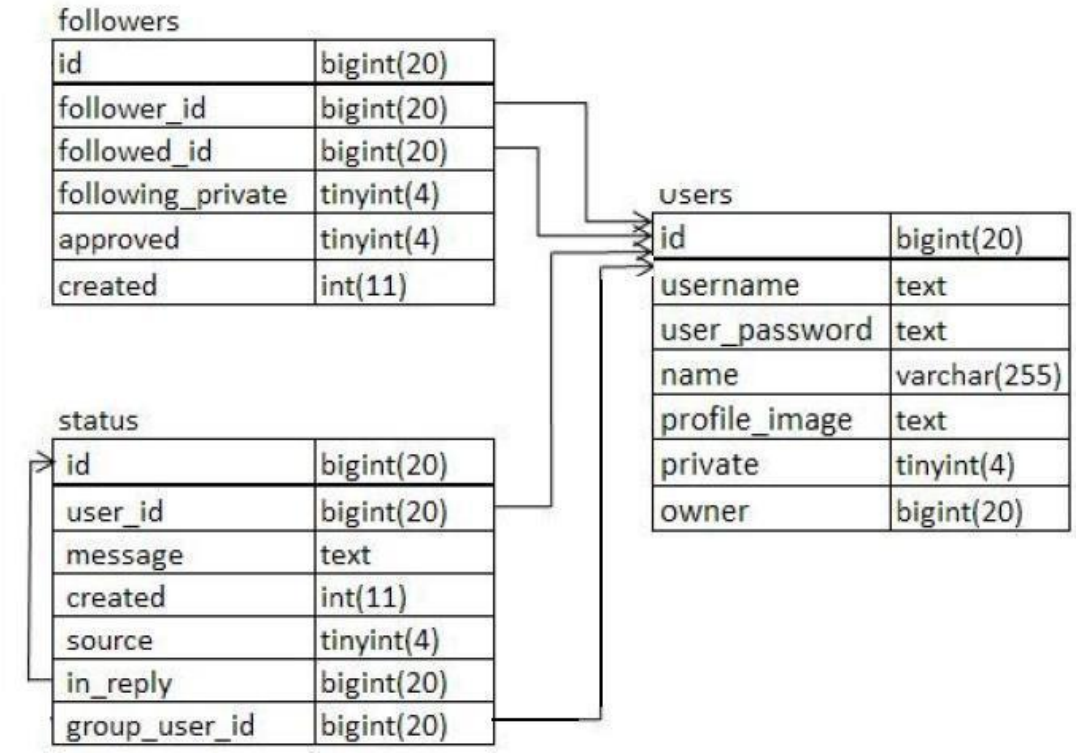


Figure 7.5. Relations between tables

7.5. API

As architectural style the Cirip Application Programming Interface (API) uses Representational State Transfer (REST) (Fielding, 2000). REST is used the most often by the online services: one of the biggest directories for Web 2.0 APIs (ProgrammableWeb, 2013) contains around 8800 APIs, whereof 63% (5600) use REST and 21% (1900) use Simple Object Access Protocol (SOAP) (Pearson eCollege, 2012).

Cirip API has a rate limiting assuring 60 GET-based requests per hour per access token, this way preventing the server overload.

The following functions are provided by the Cirip API[56]:

public_timeline – the most recent public messages
URL:http://www.cirip.ro/statuses/public_timeline.*format*
Format: xml, json;

user_timeline – the most recent messages sent by the selected user
URL:http://www.cirip.ro/statuses/user_timeline/*user.format*
Format: xml, json

56 http://www.cirip.ro/cirip/api

Parameter: *user*- user id or username;

show – returns a message
URL:http://www.cirip.ro/statuses/show/*id*.*format*
Format: xml, json
Parameter: *id* – status id;

update – add a new message (requires authentication)
URL:http://www.cirip.ro/statuses/update.*format*
Format: xml, json
Parameter: status – the new message (max 140 characters);

replies – the last replies for the authenticated user
URL:http://www.cirip.ro/statuses/replies.*format*
Format: xml, json;

followers – followers of the selected user
URL:http://www.cirip.ro/followers/*user*.*format*
Format: xml, json
Parameter: *user*- username

friends – users followed by the selected user
URL:http://www.cirip.ro/friends/*user*.*format*
Format: xml, json
Parameter: *user* - username

api_version – currect API version
URL:http://www.cirip.ro/statuses/api_version.xml
Format: xml, json;

friends_timeline – recent mesaages sent by friends
URL:http://www.cirip.ro/statuses/friends_timeline.*format*
Format: xml, json;

group_show – information about the selected group
URL:http://www.cirip.ro/statuses/group_show.format
Format: xml, json
Parameter: *user* – group name;

groups_show - information about the groups in a geographic area
URL:http://www.cirip.ro/statuses/groups_show.format
Format: xml, json
Parameters: latitude, longitude, radius;

group_timeline – recent messages in a selected group
URL:http://www.cirip.ro/statuses/group_timeline.format
Format: xml, json
Parameter: *user* – group name.

As an example, in Figure 7.6. a message and the corresponding JSON (JavaScript Object Notation) format returned by the *show* API function are

presented (the JSON format is displayed using a JSON Parser at http://json.parser.online.fr/).


```
{
  "id":"27551230",
  "created_at":"Wed Mar 27 17:18:23 +0200 2013",
  "text":"Maine dimineata o intalnire cu elevii de la Liceul W.Shakespeare, despre oferta educationala a AC UPT:\nhttp:\/\/prezi.com\/mi3blfugpcr7",
  "source":"ciripfox",
  "user":{
    "id":"2",
    "name":"Carmen Holotescu",
    "username":"camil3",
    "location":"Timisoara",
    "profile_image_url":"http:\/\/www.cirip.ro\/images\/upload\/4edf04c612be3.jpg",
    "url":"http:\/\/www.timsoft.ro\/weblog"
  }
}
```


Figure 7.6. Message at cirip.ro/status/27551230 and the corresponding JSON format, cirip.ro/statuses/show/27551230.json

7.6. Plugins and Mashups

Cirip provides numerous posibilities for sending/monitoring messages on the platform:

- native scripts/plugins: online, SMS, mobile interface (http://m.cirip.ro), CiripFox Firefox extension, import/export Twitter notes, import/export RSS, e-mail, widget published on blogs/sites, YM/GTalk/Jabber messenger clients, export notes in a file, real-time wall, Post2Cirip bookmarklet;
- 3rd party mashups based on API: Firefox Ubiquity command, CiripChrome extension, CiripGadget (Google gadget), WP2Cirip (Wordpress plugin), AddThis social plugin, CiripAir standalone application, CiripME mobile application, CiripGroup Augmented Reality Layar application, Compendium2CiripLD aplication for converting Compendium scenarios in Learning Design Cirip objects.

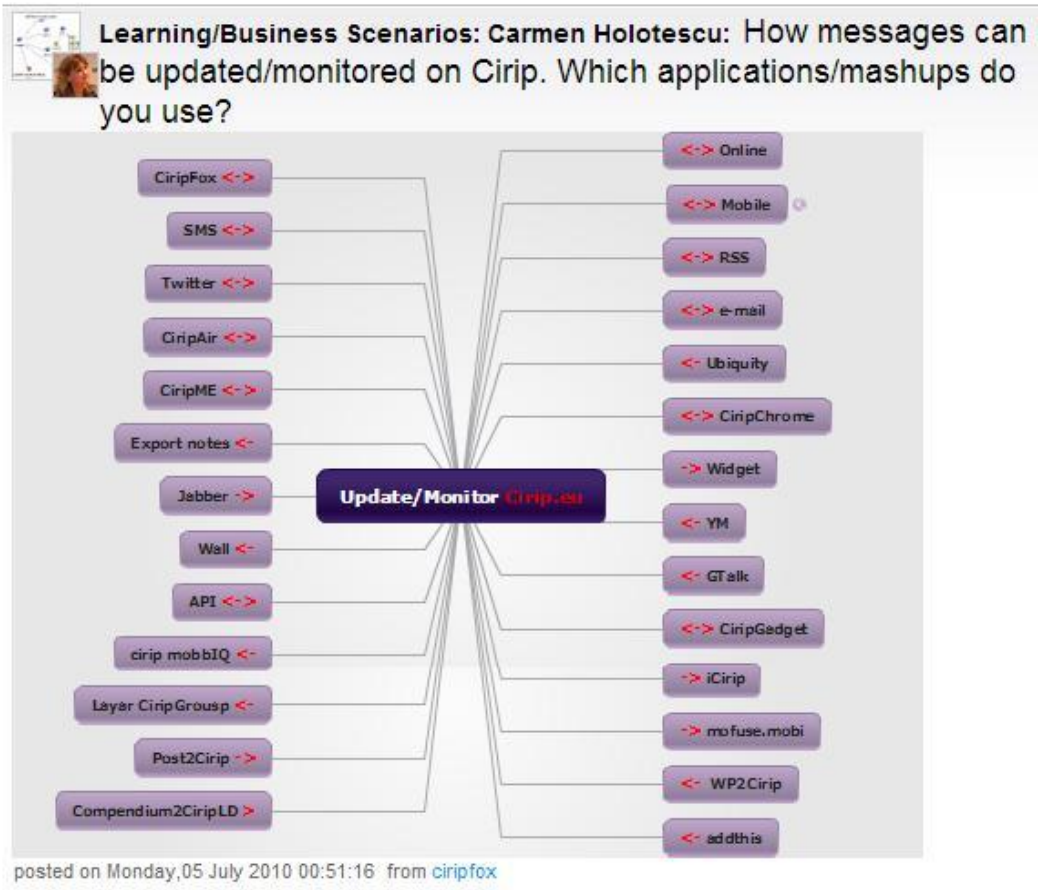


Figure 7.7. Plugings and mash-ups as a mindmap. Note at http://www.cirip.ro/status/3113278

7.7. Platform development phases

Under our coordination, the Cirip platform has been built using the Design Based Research (DBR) methodology approach (Figure 2.3). The platform initial and iterative designs are mainly our work, while most of the implementation is being done by Cristian Armeana, Software Engineer at Timsoft. Cristian Regep implemented the Firefox plug-in and also part of visualisations. We have implemented components such as those for: multimedia objects embedding, user and group layout, statistics/learning analytics and timeline, cron jobs, user and group real-time wall, etc.

The Cirip development started in January 2008, and has had a few versions/deployments, presented in the table below. In adding new features the continuous evaluation and feedback given by the community nurtured on the platform was very important (in January 2015 there are more than 125,000 users), the facilitation of the community being realized by ourself (@cami13), by @cirip (Cirip team account), @Gabriela (Gabriela Grosseck, a close collaborator) and by the group moderators.

Table 7.6. Cirip development phases

Version	Date	Features	Main related events/articles
1	March 17, 2008	Send/monitor posts, categories for microblogs, feeds monitoring, widget for blogs	- Blog posts[57]
2	April 2008	Public/private groups, search, send/monitor posts via IM/SMS, statistics, visualisations	- Blog posts[58] - The educational features of Cirip were presented in article "Can we use Twitter for educational activities" (Grosseck and Holotescu, 2008), being compared with those of Twitter. The article is considered one of the most important in Microblogging in Education area, having now 260 citations[59] and being one of the references for Twitter Wikipedia entry[60].
3	January 2009	Multimedia objects embedding, polls, tags, mobile learning features, groups for (educational) online marketing, API	- Cirip was presented at the First European Microblogging Conference in Hamburg[61] - Cirip appeared on Top 100 Tools for Learning 2009 (position 67)[62] - Excellence prize at CNIV 2009, Iasi, for the article "Cirip.eu: Building Learning Communities on Microblogging Platforms" (Holotescu and Grosseck, 2009a)[63]
4	2010	Learning design scenarios	- Cirip was Finalist at Seedcamp Zagreb, January 2010[64]
5	2012	New mash-ups	- Cirip was nominated by UNESCO Romania for "UNESCO King Hamad Bin Isa Al-Khalifa Prize for the Use of ICTs in Education" - April, 2012[65]
6	2013	Augmented reality features consolidation, design features for running MOOCs	- the team having as members Prof.Dr.Ing.Vladimir Creţu, Carmen Holotescu, Gabriela Grosseck and Cristian Armeana was nominated for the "Innovative Education Award", WCES 2013, Rome, 5-8 Febr, for the

57 http://www.cirip.ro/blog/?m=200803
58 http://www.cirip.ro/blog/?m=200804
59 http://tinyurl.com/citations08
60 http://en.wikipedia.org/wiki/Twitter
61 http://www.cirip.ro/grup/mbc09
62 http://c4lpt.co.uk/top100tools/top-100-tools-2007-2012/
63 http://www.edumanager.ro/articol.php?id=5524
64 http://www.cirip.ro/grup/seedcamp
65 http://www.cirip.ro/status/17643413

			research related to Cirip.eu and Microblogging in education[66]
7	2014 - onward	Future developments	- presented in the final chapter.

7.8. Conclusions

The chapter presents the centralized architecture of the educational platform, developed in an iterative cycle (part of the second DBR phase – Figure 2.3), based on the continuous monitoring of Social Media / emerging technologies / educational trends and on the feedback of users.

66 http://wces.info

Chapter 8. Platform as an Open Learning Environment

8.1. Introduction

During the last years, as many articles and studies have indicated, Web2.0 technologies have been used to support innovative approaches in higher education (Conole and Alevizou, 2010; Hamid, Chang and Kurnia, 2011). Blogs, microblogs, social networks, media sharing sites, social bookmarking, wikis, social aggregation, and virtual worlds are used increasingly by students and teachers for communication and collaboration, for sharing resources or for building personal learning environments. As the classic learning management systems (LMS) are considered too inflexible, there are many projects/implementations of integrated platforms, in which the social functionality becomes available inside the LMS, thus speaking about LMS2.0, social LMS, Open Learning Environments or Social Learning Environments (Crosslin, 2010; Dahrendorf, 2010; Mott, 2010; JISC, 2011).

The approach for Cirip was from the perspective of integrating the facilities of a LMS within the social network, thus the microblogging platform becoming a social LMS.

This chapter presents the Cirip features as a Mobile Social Learning Management System (msLMS): Learning Management and Mobile Learning features, how Social Objects are integrated as (small) Open Educational Resources in the platform flowstream, how Learning Scenarios can be specified as Learning Design Objects, and also the facilities implemented for student Assessment.

Each group of Cirip acts as a msLMS, having a specific *groupname* which appears in its URL (http://www.cirip.ro/group/groupname). Also, the *groupname* is used to post a message in that group (syntax is *@groupname* for messages sent from the browser interface or just *groupname* in a text message). The group virtual space preserves the whole materials/interactions of the group members.

Its virtual space represents a simple, efficient, adaptable and scalable solution for:

- course in a university/college;
- company training;
- community of practice;
- team collaboration and management;
- space for mentoring/coaching;
- service related to an application/product;
- event: workshop, conference, etc.

8.2. Learning Management Features

Almost all universities use LMS – *Learning Management Systems (VLE - Virtual Learning Environments)* for their online/blended courses. A LMS provides the following features (Holotescu, 2004b):

- secured and controlled access to the environment – each user has his/her own account; the environment is accessed from a web browser; users have special rights concerning the use, the management of the environment;

- their activity and portfolio are usually visible; some environments have the possibility of automatic evaluation of the competences and learning needs;
- course content access/management – learning modules in various formats (HTML, audio, video), templates for developing new materials, for planning activities, for notifications, search possibilities, access to resources, online libraries;
- communication – with the facilitator and between participants through asynchronous conferences (discussions forums), chat, e-mail; some environments have the facility of sending private messages;
- evaluation of the participants – assigning homework, creating and managing questionnaires;
- offers the possibility of working in groups, with private communication zones;
- management – generation of accounts, course component management.

The LMS are considered too inflexible, the main drawbacks being:

- they are "walled gardens": the materials and students portfolios are accessible only by the LMS users,
- the learning community doesn't include external experts and learners and is nurtured only during the course duration, and
- the emerging Social Media tools are not used.

These disadvantages are eliminated in Cirip, which has the characteristics of a Social Learning Management System, depicted in this subchapter.

8.2.1. Cirip as a course environment (Social LMS)

Each course on the Cirip.eu microblogging platform is run in a blended manner, in a private group which requires the approval of the group moderator (discipline coordinator). Such a group is structured in observance of the general elements of a LMS (Figure 8.2.1):

Public presentation part – The *Description area***.**

Participants Portfolios. A personalized microblog provides the opportunity to set up a public profile/portfolio of a student with photo/avatar, name, a description, the link to the authored blog, background, the type of the microblog; then to build up a network of other colleagues or other users / other public groups, livestreaming etc. Students can export their micro-posts as a widget on personal blogs or on other sites. They can monitor sites, blogs, or activities on other social networks through RSS feeds or search feeds (using the platform specific feature). They can also import/export notes from/to Twitter.

A microblog can be seen as a Personal Learning Environment where the student can keep up to date with university life stuff, find resources to use and learn from, discuss with peers (but also with specialists, other teachers, other Cirip users) their topics of interests/hobbies, have fun (play week-end games or join all kind of other „informal" activities from public groups). Also the student can participate in a number of courses, the portfolio being enlarged at each participation. Also the learning community nurtured during a course will continue to collaborate after the course end.

A notice board for up-to-date course information Groups have an *Announcements* section where moderators can post notes, basic teaching materials, additional resources in a variety of formats (LOM/SCORM or multimedia) and links to other resources for the course activities.

Administrative section: teachers can add/remove students, post announcements/materials *Announcements* section, send notifications to participants by email or SMS, create and conduct polls and quizzes (which can be answered online or by SMS), access internal/external search possibilities; assess students participation and the cohesion of the learning community using statistics and visualisations in the Network and Tagcloud sections.

Student-teacher communication area: this is the central part of the course, consisting of the interaction between students and teachers, and also between students.

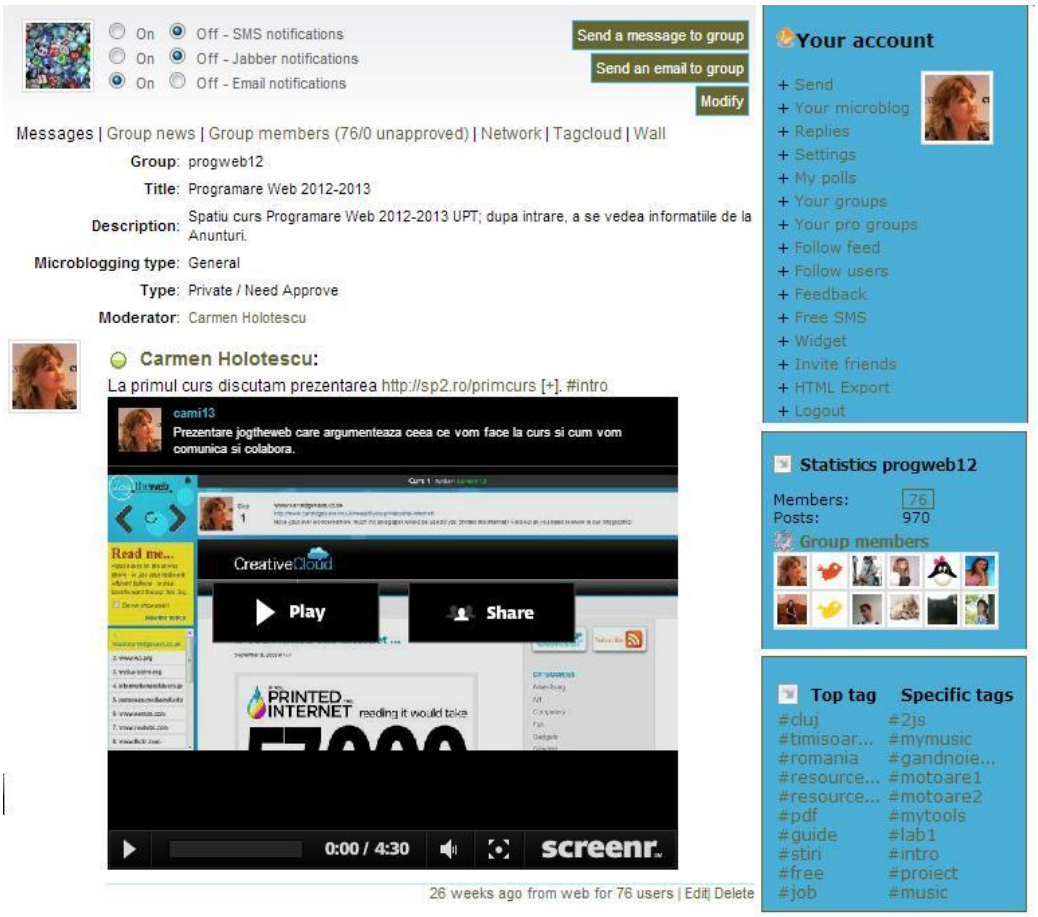


Figure 8.2.1. A group hosting a blended course

Messages can be sent and received via the web, mobile version (m.cirip.ro), through SMS, instant messaging clients (Yahoo, Jabber), e-mail, Firefox/Chrome extensions, API, desktop and other 3rd party applications; notes can also be imported from Twitter and RSS feeds.

A user can embed multimedia objects in the notes, such as images (flickr, picasa albums), video clips (youtube, vimeo, dotsub), audio (deezer, blip.fm, vocaroo) and (live)video files, live-streaming (qik), presentations (slideshare, voicethread, prezi, photopeach glogster etc.), cognitive visualizations like diagrams or mindmaps (mindmeister, mindomo, spicynodes, diagrammr), files (scribd, Google documents, any online file); students become active participants in the process of sharing, organizing and generating content, which can be seen as „little OERs" (Weller, 2010). A similar notion we have defined in 2005, when analyzing how blogs could be used in education, we noted that blog posts can be considered as a kind of Learning Objects or Open Educational Resources, which could be used to enhance online or blended courses (Holotescu, 2005). The same, OERs could be considered the collaborative collections of resources created on the bookmarking system delicious.com, collections of RSS feeds on a specific topic (grouped as OPML) or annotated and descripted images on flickr.com, all used in the courses we have facilitated (Holotescu, 2004a).

In order to classify the messages posted in the group, specific tags are used for the course activities. Students can participate at the course using desktop computers or mobile devices, which allow an interactive participation even outside the classroom walls (Livingston, 2010), being capable to send and receive notes from the platform by using a mobile navigator (m.cirip.ro) or via SMS.

The content course can be enlarged with Real-Time information on course topic: messages imported from Twitter containing specific terms and RSS items of a blog/site (usually authored by facilitator) or of a search feed.

8.3. Mobile Learning Features

This type of learning can be though used successfully by associating instant messaging with the SMS and the characteristics of social networking applications, which developed rapidly into *microblogging applications*. Whatever platform we use (Twitter, Plurk, Edmodo, Jaiku, Identi.ca, FriendFeed, Cirip and to some extent Tumblr, Posterous or Facebook), we're witnessing a new paradigm blooming / expanding in the hands of our students (Feijóo et al., 2009), the generation that has not known life without mobile phone" (CDE, 2008).

While in recent studies (Herrington et al., 2009) it appears that few academic institutions in the world have adopted widespread m-learning technologies, there is evidence that **m^3-learning - *mobile multimedia microblogging learning* -** happens, becoming a reality in university settings (Ebner, 2009), providing a fast, mobile and more flexible possibility of comunication, information management and networking (Lundin, 2010) between teachers, students and faculty staff, both for teaching and learning, in 140 characters or less (Blake et al., 2010).

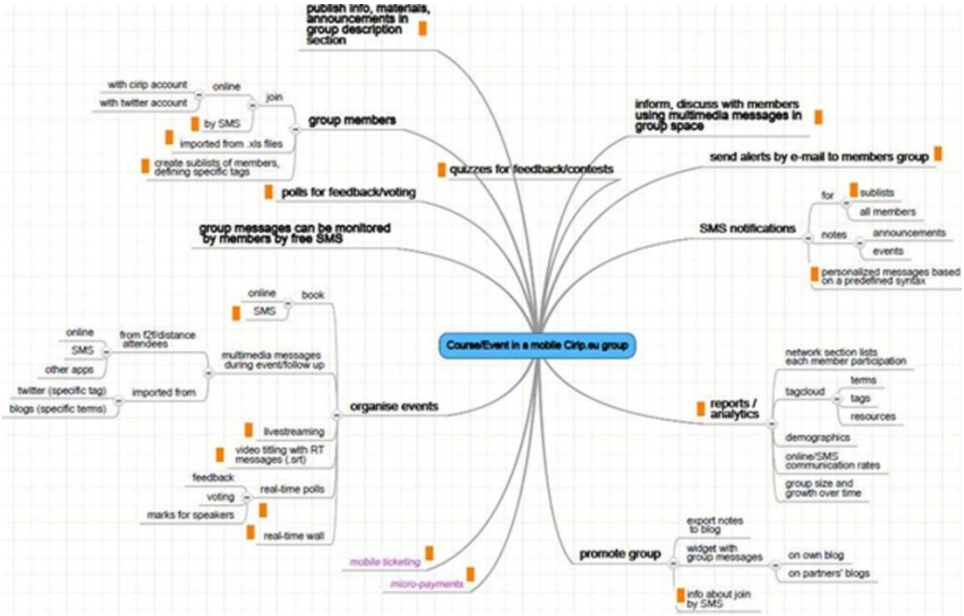


Figure 8.3.1. Mobile Learning features as a LD object, source http://www.cirip.ro/status/25893812?lg=en

In this context, our work aims at integrating microblogging in higher education by valorizing the mobility parameters of the Cirip.eu platform for the purpose of increasing knowledge and learning in authentic environments. Thus, the purpose of this section is not only to provide a general overview / a framework for using microblogging through mobile technologies, but also a way to enhance teaching and learning in formal university courses. We focus here on the following two questions:

„What are the mobile technology affordances for teaching/learning with this platform in HE?"

„What are the pedagogical uses of m^3-learning on the Cirip microblogging platform?".

8.3.1. M^3-learning features

The Cirip specific features for m^3-learning are presented in the following framework (Table 8.3.1), which extends the Patten, Sanchez and Tangney classification (Patten et al., 2006). Most of the characteristics are unique to Cirip and cannot be found on other educational microblogging platforms (Holotescu and Crețu, 2013). We should also note that the features are assured by a single platform - Cirip, while in the (Patten et al., 2006) work, mobile applications that offer just one feature category are listed.

Different scenarios for developing/running/facilitating learning inside the mobile groups can be specified as Learning Design objects in the dedicated group of the platform (http://www.cirip.ro/grup/lds). This way, scenarios can be shared, validated, improved and reused. Figure 8.3.1 presents the mobile group features as a Learning Design object; the characteristics unique to Cirip are marked.

The administration panel of a group contains a dashboard for SMS management, these features also being unique to Cirip as well, no other educational microblogging platform offering such a support. Figure 8.2.2. illustrates the dashboard section for creating dynamic commands, meaning that when an SMS containing a specific command (keyword) is sent to a group, the platform will automatically reply with the answer prepared by the group administrator.

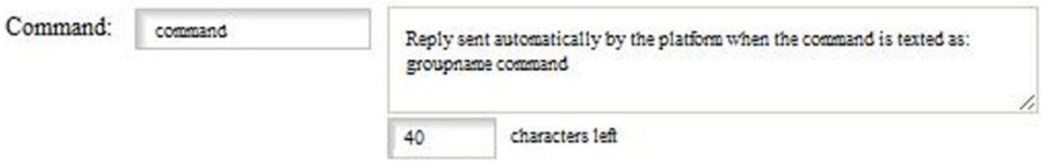


Figure 8.3.2. Dashboard section for creating a dynamic command

Table 8.3.1. m³-learning framework

Category	Cirip specific mobile features
Administration	• the moderator/facilitator creates the group, setting its properties: private/public (for a private group, its sections are visible only for members; in the case of a public group, its messages are visible for anyone, but only members can send new messages), open/close (anyone can join an open group, while the facilitator approves each new membership for a close group); • a moderator can dynamically create group accounts for the users specified in a spreadsheet file; • moreover, he or she can define sublists of the group members by using specific tags; • a person can join a group via a (mobile) browser, the mobile version m.Cirip.eu or by SMS; mobile number or cirip/twitter username can be issued for authentication; • for private groups that host trainings/events for companies, one can become a member by sending an SMS for micro-payment; • password recover can be realized online or via SMS;
Reference	• by using a (mobile) browser, students can access course materials/resources/announcements published in the group space; • they can also access multimedia resources embedded in messages; • specific terms/tags can be searched in the group messages;
Interaction	• students share and ask opinions from peers or other users by using a (mobile) browser or via SMS; • messages are classified using specific tags; • students can follow users, groups and feeds via free SMS; they can specify the time interval for SMS delivering; also when these alerts should be stopped or restarted, by texting cirip on/off; • during the f2f courses and activities, if teachers agree, students can send SMS including questions, comments in groups, for future reflections; also their observations during activities outside universities; • send feedback / comments / questions via SMS to dedicated groups, during workshops or conferences; • participate via SMS in polls and quizzes operated during courses or events; • after sending an SMS with the groupname and a keyword, learners receive a response via SMS containing: • courses/exams/events/f2f mentoring schedules • grades; • during a live event the messages posted in a group can be monitored by using the group real-time wall; • the notes of a public group can be exported or listed in a widget on a site/blog; this is an important feature for a course/event promotion/dissemination; • members can interact by using private messages;

Multimedia Collaboration	• facilitators and participants create collaborative multimedia objects embedded in the group messages; such objects (images, audio/video clips, presentations, files, mindmaps) can be created/shared on different social media platforms and can be considered little Open Educational Resources (Weller, 2010); • comment videos by sending SMS in courses/teams groups; messages are exported as an .srt file and used to subtitle the video; • send images, (live) video / audio clips during events, activities;
Meta-Collaboration	• by communicating with members and groups, in a continuous evaluation process, integrating (search) feeds and collaborative activities/resources from other social networks, members can build and manage mobile Personal Learning Environments; • scenarios for teaching and learning represented as mindmaps are discussed/improved by using a mobile browser, in a group dedicated to learning designs (Figure 8.3.1);
Location-based	• by using a Cirip mash-up implemented on the augmented reality browser Layar, one can geo-locate, find information and join different groups; the mash-up is important especially for finding groups for workshops, events, trainings, being a valuable facility for educational marketing;
Facilitation	• the course core materials, additional resources and announcements are published by moderators in the Materials section of the groups; • group moderators can send alerts via e-mail/SMS to groups members, announcing news or updates with a high priority; • alerts via SMS can be sent to specific subgroups/teams, being an important feature for groupwork facilitation; • by following users, groups and feeds via SMS, teachers / trainers receive updates related to courses in real-time; they can thus participate in discussions, give feedback via SMS, being active even when they don't have access to internet; • group moderators can create dynamic commands/responses for administrative aspects asked by members via SMS (see Administration), by connecting keywords with specific actions (Figure 8.3.2);

Monitoring	• the number of messages sent in a group via a mobile browser or by SMS are visible for the group moderator, as well as their distribution in time; • other statistics for group activity are accessible for the facilitator: ◦ the most frequent words, user names and tags, showing the topics discussed and also the most active/referenced users; ◦ the types and number of multimedia objects embedded in the group messages, also the applications/plugins used to send them;
Assessment	• for each member of the facilitated group, the administrator can assess his/her ePortfolio/PLE/activity, having access to statistics such as: ◦ number of messages, ◦ tags, ◦ types of multimedia objects included (showing the activity on different SM platforms and his/her connections with OERs),

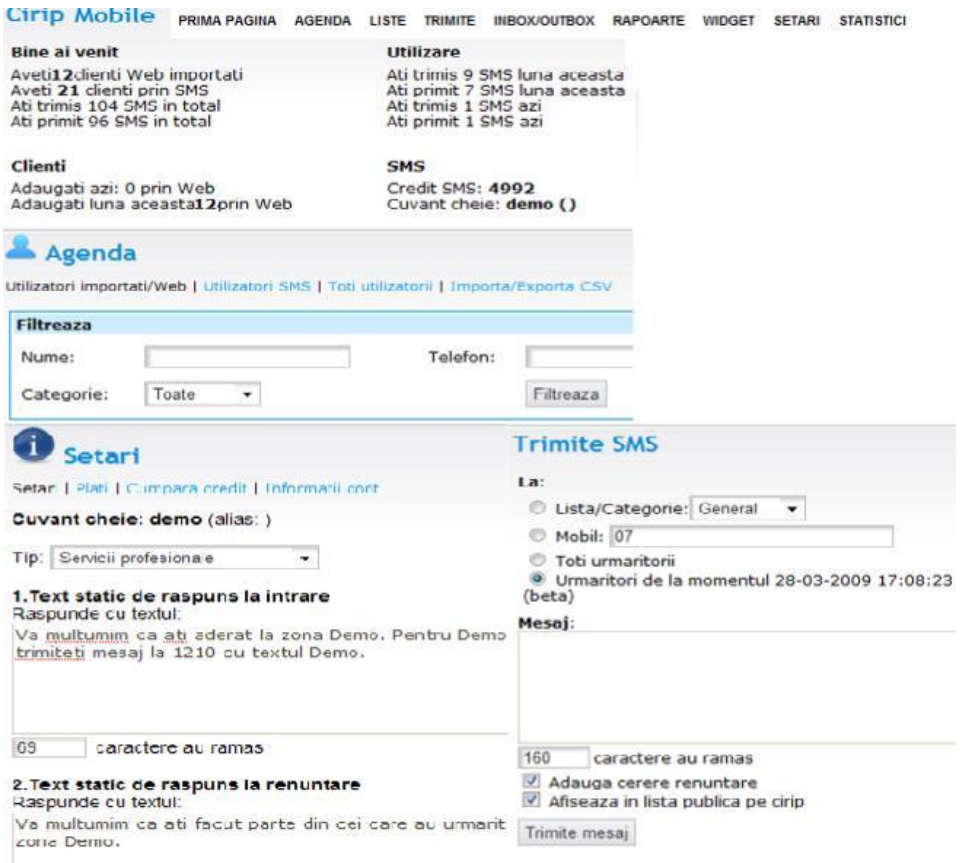


Figure 8.3.3. Dashboard for a mobile group

In Table 8.3.2 some examples of dynamic commands are specified for different educational contexts: course, training or mentoring group (a mentoring group could be one that connects a teacher with the students supervised for dissertation/master thesis), and event / conference / workshop.

Table 8.3.2. Text messages and specific actions

Context	SMS	Action
General		
	cirip ?	• the platform will automatically respond with an SMS containing the list of the most important active groups that host courses or events
	groupname ?	• the platform will automatically respond with an SMS containing a short description of the group and its commands
	groupname on/off	• user joins/leaves the specified group
Course / training / mentoring		
	course schedule	• the platform will automatically respond with an SMS containing the schedule of f2f classes/laboratories/mentoring sessions
	course grades	• the grades of the student are sent by SMS as an automatic reply
	course question/ comment	• the question/comment will be registered in the group space, so that the teacher/colleagues are able to reply/comment online or via SMS; it is recommended (at least) for the teacher to monitor the group via SMS, this way responses/feedback would be prompt
	course number	• students reply by SMS to a poll conducted by teacher/colleagues
	course srt comment	• collaborative exercise for commenting a movie while watching it
	project specifications	• using the dashboard, teacher creates sublists for the groups of students; for each sublist he/she sends via SMS specifications/additional resources useful for the project the students in that sublist have to develop collaboratively
Event / conference		
	event session	• user subscribes to take part in a specific session; platform sends an SMS for confirmation
	event speaker rate	• during the event/conference participants are able to rate by SMS the lecture delivered by a speaker
	event speaker question	• questions could be addressed to speakers, they will be registered in the event group; the answers/debates could be sent/take place during and after the event, implying distance participants too
	event quiz	• a quiz specific to the event is launched

8.3.2. Pedagogical uses of m^3-learning on Cirip

Over the last seven years we have run different courses with students enrolled in several years and forms of study, covering a variety of profiles and specializations, from three universities: University Politehnica Timisoara, University "Ion Slavici", Timisoara and University "Vasile Goldis", Arad. The courses were hosted in private, blended-mannered groups on the platform.

In order to gather the students' feedback for identifying a number of aspects regarding the use of microblogging in their mobile learning experience, we asked master students to engage in the following activities:

- create a mobile digital narrative using a social media application at their own choice;
- collect digital media (pictures / videos / audio) and post them on the platform;
- create a digital story collaboratively;
- livestreaming from different events (academic, scientific, theatre festivals, concerts etc.).

Figure 8.3.4. Quiz for participants at the end of a course - http://www.cirip.ro/sondaj/7

After the course evaluation, students were asked to answer some questions in a survey posted on the platform regarding the benefits and disadvantages noticed during this experiment.

Table 8.3.3. A preliminary feedback from the students

Advantages	• *Accessibility*: access to information is available anywhere (irrespective of location), where there are no schools, teachers, or libraries. • *Flexibility*: • for the learning services market for persons who don't have access to the computational infrastructure (accessibility to the internet and e-learning is not widely spread in rural or distant areas); • the learning services market for persons whose jobs require permanent move or students who need individualized education. • *Audience* (mobility): reaches all students, anytime. • *Monitoring* mechanisms and personal messages received entirely. • *Long-lasting interaction* for multiple purposes.
Limitations	• Except for SMS following, most of the mobile functions on Cirip are still *underexploited* by the community members. • Content development for all types of mobile terminals can be *difficult*.
Risks	• Technology might *not function* for the aimed purpose or might nor respond to the learning needs. • Encouraging *incorrect SMS*-like writing. • Students might need *additional training* actions in order to use efficiently the microblogging technology with the help of mobile devices.

Defining a mobile pedagogy for the Cirip.eu microblogging platform led us to emphasize those characteristics that place the m^3 aspects of Cirip within informal, rather than formal learning. Thus, some of these attributes, that altered the educational practices during the formal courses facilitated on Cirip by using mobile technologies, are:

- *Communication with members and tutors took place in a notational form,* by using text messages. Capture, storage and research of information in multimedia format was also a process resulting from the convergence of Cirip microblogging facilities, students' learning skills and their social interaction (Traxler, 2009).
- *Learning was personalized.* It facilitated those individual and collaborative learning experiences, which allowed students the freedom to choose those social media applications they used during their courses.
- *Collaboration through SMS messages led to connected classroom learning*. Thus, following certain users / groups supported collaborative learning even outside the course.
- Creating extended opportunities for *direct learning*. For example, supporting alphabetization for less digital competent students, but also learning of foreign languages, English and Spanish particularly, following the integration within courses of the informational flux of the Conference on personal learning environments in Barcelona, in July 2010, http://pleconference.citilab.eu.

- *Psychological Comfort / A good motivation.* Mobile multimedia resources may make learning funny (individual lack of motivation should be however avoided because, in this case, students might feel discouraged especially if they don't have access to advanced mobile devices).
- It allowed for *learning methods based on social media* (Flickr, YouTube/Vimeo, SpicyNodes, Voicethread, Prezi, Vocaroo, Google Docs etc.) and peer-to-peer support (meaningful content to help / create innovation).
- *Development of mportfolios* for acquiring knowledge and skills (mobile abilities), necessary for acceding on a mobility-dominated job market.

8.4 Social Objects as (little) Open Educational Resources

8.4.1. Social and Multimedia Objects

Jyri Engeström[67] (2005), co-developer of the Jaiku[68] microblogging platform (acquired by Google in 2007) and then responsible for Google mobile applications, has launched a theory stating that, in most cases, people base their relations on certain objects, which he named "social objects". These can be physical, such as "location", and semi-physical (such as „attention") or even conceptual, such as "on-line presence". According to Engeström, objects become the center of any social relation and the nucleus/fundamental notions of a strong social network, for which he defends the approach called "object centered sociality". "*The social networking services that really work are the ones that are built around objects".*

In such a network built around social objects, people will connect to objects, objects to people, objects to objects, and people to people (becoming friends through a social object) (Betta, 2007).

An important feature for Cirip is allowing the creation of a personal profile and/or portfolio including ideas, projects, research, information resources, multimedia objects created individually or collaboratively. Thus on Cirip each member to be able to build not only a Personal Learning Environment but also a Personal Learning Network.

From this perspective and according to classifications of Stutzman (2009), Cross and Conole (2009) and Engeström (2009), Cirip is both a *profile-centric network*, and a *social object-centric network* :

1. the objects are part of the communication-conversation flow of the platform;
2. the objects connect Cirip with other Social Media applications organized around educational objects;
3. objects can be reused, validated, created or recreated individually or collaboratively, thus Cirip offering an opening to Open Educational Resources – OERs;
4. *meta-objects* meaning *objects of learning design - LD* can be created; the *objects of learning design* specify learning scenarios, best practices for integrating new technologies (Cirip in particular) in education; Compendium scenarios can be imported to reach the experience of other

67 Jyri Engeström's profile at CrunchBase http://www.crunchbase.com/person/jyri-engestrom
68 Jaiku (this name because the posts on Jaiku resemble Japanese haiku), purchased by Google in 2007, was shut down in January 2012; Jaiku had 15000 users; Google published Jaiku code at https://code.google.com/p/jaikuengine/.

communities of practice in LD;

5. by extension, public or private groups can be considered as *social objects*, functioning as sLMSs (social Learning Management Systems).

In this section we aim first at analysing the multimedia features that distinguish Cirip.eu from other microblogging platforms. The multimedia objects represent a type of Social Objects included on the platform. The Decalogue below reveals the most important reasons for embedding multimedia objects in notes:

1. Objects become a part of the informational/conversational flux (the presence of a link in a message would mean only a resource to visit optionally).
2. By learning about their use and actually using them, users improve/acquire both new technical skills and better communication abilities (especially in genuine situations).
3. By accessing the social networks from which the objects are included, users learn to search for/validate educational/business resources. In time, these networks are included in one's personal learning environment/network PLE/PLN – and many users create their own resources or collaborate in order to create new resources on these networks.
4. They facilitate the development of courses/trainings.
5. Users participate actively to the learning process by gaining information in multiple ways.
6. They stimulate the understanding and interpretation capacity.
7. They become a part of each user's portfolio.
8. They represent an openness to OER movement, each object can be considered a little OER (Weller, 2010).
9. They satisfy an increased information and culture consumption (by enlarging the Web 2.0 specialized culture horizon).
10. People participate also affectively through digital storytelling instruments to knowledge / learning / socialising experiences etc.

Objects included in messages were selected by the Cirip.eu implementation team following the results of our experience of using the Web2.0 educational applications. The list is permanently completed with the newly-appeared types of resources, which assist the didactic and educational process. A useful feedback related to these facilities as well is coming from platform users.

8.4.2. Types of multimedia objects

The multimedia objects which can be embedded in messages are:

- ***images***: flickr, tinypic, any image by URL – can illustrate a concept, state, event; they can be diagrams, graphics, personal photos;
- ***audio***: eok, trilulilu, deezer, blip.fm, mp3 file, vocaroo (live audio) – audio recordings offer a touch of realism to practical exercises, they replace (and/or complete) the absence of verbal explanations, they also represent a student-student or group communication channel, accessible and easy to use; besides personal communications, the videos included can be recordings from events/communications;
- ***video***: youtube, dotsub, seesmic, vimeo, myvideo.ro, 220.ro – offer visual dynamics and relevance to the learning unit (or the real world), grab attention, intensify the students' imagination; for example, at dotsub collaborative translations can be done, either directly on the site, or using a collaborative document;

- ***live video*** – may clarify concepts which cannot be discovered only by text; useful for personalized communication, interviews, recordings/interventions for various events;
- ***livestreaming*** – the broadcast of a course, theatre play, event, concert, interview etc.;
- ***presentations***: slideshare, voicethread, capzles, picasa, photopeach, notaland, authorstream,
  glogster, prezi, screencastle, screenjelly, screenr – useful in digital storytelling, a high degree of liberty in exercising creativity and/or imagination; each can constitute a micro-lecture; they can be created individually or collaboratively;
- ***mindmaps*** - mindmeister, diagrammr, mindomo, spicynodes – for concept classifications and clarifications;
- ***files***: pdf, doc, xls, ppt, txt, rtf, odf – for example, learning resources can be available (for downloading too) to students in classical format as well; thus, students are also able to prepare case studies, essays in these formats;
- ***hyperlinks*** – ensure the transfer to other media fragments (the button *Shorten* helps to introduce a long link);
- ***polls*** and ***quizzes*** – the utility of polls is multiple:
    - they can have a personal character or aim at social, cultural, economic, educational, political aspects;
    - students can initiate polls, their way of thinking can be found out, feedback, testing;
    - they can be active for a long period;
    - they can be created in real-time at a f2f course, conference, event, workshop – participants or those watching from a distance will be able to vote online or through SMS, the results being projected in real-time;
    - at courses/trainings there's the possibility of answering through SMS to questions with multiple choices – courses/trainings will have an associated group for development in blended approach;
    - within the groups, the moderator or any other member can create polls in order to find out the opinions or decide on a certain variant;

For all of the embedded objects it is important to respect the license and to mention the source.

In order to embed an object in a message a specific syntax is required: object URL or network:value. When a message containing such a syntax has to be displayed on timeline, the *Status Parser* contained in *Status Sending Module* (Figure 7.3) will replace it with the embed code for that particular object. This solution requires a continuous monitoring of the social networks for updating the embed codes. We started to evaluate other variants, such as: Facebook Open Graph protocol http://ogp.me/ and http://embed.ly.

8.4.3. Multimedia objects for digital storytelling

From a pedagogical point of view, it is considered that the extremely generous range of online tools for creating digital stories offers countless possibilities of expressing creativity. Moreover, this technique can be applied to almost any discipline / topic.

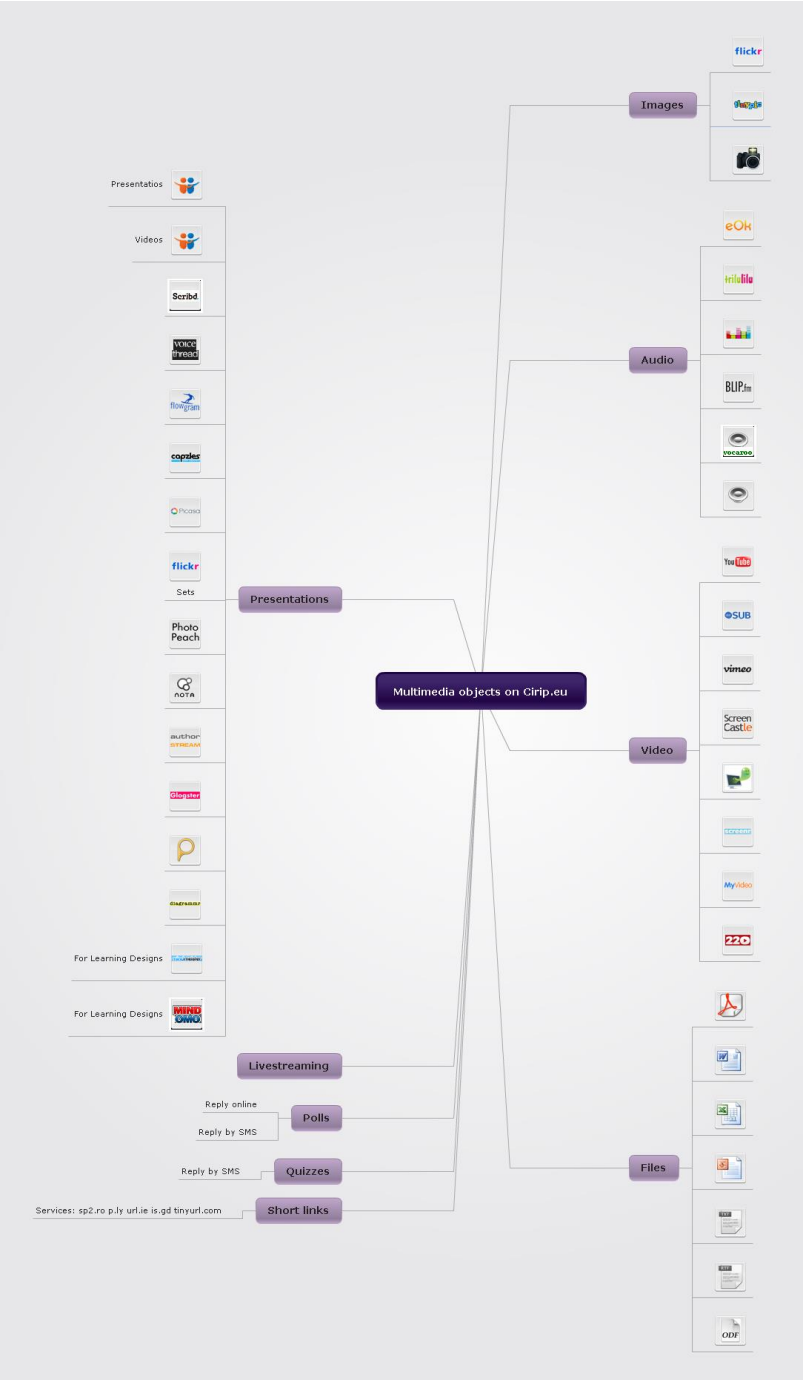


Figure 8.4.1. Multimedia objects included in messages – mindmap at cirip.ro/status/3109554

The choice of storytelling tools was determined firstly by the fact that „everyone has a story to tell" and through a multimedia-flavoured content attention is drawn on spectacular storytelling. Secondly, *photopeach*, *notaland*, *capzles* and the more recent *glogster* or *prezi* are tools that correspond to the actual educational needs, being easy to use, requiring minimum technical knowledge. Thirdly, another fact that matters is the way in which these applications address different learning styles of pupils/students and the fact that they allow for collaboration and sharing (annotation and comments included) and not only individual study. Last but not least, through the emotional connections with the content one may succeed in developing really sophisticated multimedia digital stories, both from the point of view of realisation[69] and of the affective sense / signification of the digitally incorporated content of ideas.

In addition, teachers/ tutors learn how to integrate efficiently Web 2.0 resources in the educational process while pupils / students actually learn how to use technology in a funny, relaxing way and the fact that they know they can use (almost) any digital storytelling tool (for example animoto through youtube export, or autorstream, or animation through screencastle) for personal experimenting contributes to professional development, and respectively to enhance self-esteem.

8.4.4. Advantages and limits of using multimedia objects in teaching-learning

The *benefits* of integrating multimedia objects on cirip.eu (used especially for courses running on the platform) are:

- incorporate audio fluxes (for example vocaroo) and video fluxes (seesmic), even in real-time (livestreaming);
- present a high degree of interactivity, thus allowing both students and instructors to send and receive multimedia materials;
- offer consistency, visual expressiveness and personality to the created microblogs (increasing the degree of user participation to the activities occurring on the platform, according to personal preferences);
- are student-focused – see the micro-lectures-explanations realised with ScreenJelly, Screenr or ScreenCastle;
- drive the access to a qualitative educational digital content (see the *Announcements* in the group, for example);
- are useful also for persons with visual or hearing deficiencies.

The use of the cirip.eu platform implies (sometimes even requires) a prior instruction of the students for using the platform and the implementation of multimedia technologies/objects, in order to obtain a real efficiency of the educational act. Some of them end up making an objective out of learning how to use the platform and not the suggested learning units.

69 They favour also the acquirement of new skills, not only technical but also of research, communication, collaboration, sharing etc.

8.5. Learning Design Objects and Scenarios

8.5.1. Learning design objects in microblogging context: a group for sharing educational strategies

Learning design aims to enable reflection, refinement, change and communication by focusing on forms of representation, notation and documentation, also to support teachers in making pedagogically informed, better use of technologies. The scope of learning design is to improve the quality of the learning experience, learning outcomes and learner support (Cross and Conole, 2009).

As Ebner et al. (2010) noted, there has been increasing research done on the use of microblogging in learning scenarios. Therefore, in 2010 we have opened a *group of learning design*[70] (LD) to share best practices. LD group members can be teachers, practitioners in education, trainers, students, but also other persons interested to maximize the benefits of using social media for career development or business.

The aims of the group are:

- to support innovative strategies in order to engage and empower teachers and learners and make learning more accessible and participative;
- to inform about the learning design domain and its importance for the educational process;
- to encourage the sharing of effective pedagogies experiences and the integration of new technologies (in particular Cirip.eu) in education;
- to create, discuss, analyze, evaluate, improve, adapt, and reuse such best practices represented as learning designs;
- to get learners' feedback, empowering them as creative participants in the design of learning;
- the scenarios refer to formal, non-formal and informal education, to educational events, to social learning in general.

The discussions and exchange of experiences in the group dedicated to learning design both assess the value of technology-enhanced learning and bring new resources and information in the field.

The "Announcement" section of the group presents the Learning Design field, together with notable projects: variants of EML - Educational Modeling Language developed by the Valkenburg Group, IMS-LD standard, JISC Design for Learning Program, modeling tools such as LAMS, Reload, CopperCore, CompendiumLD, etc. If other communities of practice related to LD are hosted by dedicated platforms, the LD group on Cirip.eu is integrated on the platform where these scenarios are used effectively, so they can be validated and improved. Thus, the possibility to communicate and collaborate around the LD meta-objects makes Cirip similar to Cloudworks, but Cloudworks is a network focussed strictly on LD.

We have chosen mindmaps and diagrams, with the corresponding Web 2.0 applications Mindmeister, Mindomo, Spicynodes and Diagrammr as solution for nonformal representations of learning design. These are accessible to non-technical users, can be collaboratively edited and can be embedded in Cirip notes.

Thus the conversation in the group is built around these learning design objects seen as a type of platform social objects. They can also be considered meta-objects, as they reflect scenarios for different activities on the platform.

70 http://www.cirip.ro/grup/lds

The LD group activities are described below and in Figure 8.5.1:

- a LD is embedded in a message with a dedicated tag; LD can be created by a single member or collaboratively, or can be imported as Compendium LD; different versions of this LD can appear in different messages, with the same tag;
- articles in which the LD was presented; the same tag is used in the messages in which articles are embedded or specified as links;
- other articles/resources with LD/scenarios similar with the original LD; articles/presentations/resources/quotes can be embedded, the same tag is used;
- discussions/validations/proposals for improvements/uses related to LD/resources, tag is used;
- LD can be used/improved/re-created in educational activities/courses hosted in cirip groups; feedback shared in LDs group;
- group facilitators can present the most important LDs in the Materials section of the group, specifying the corresponding tags based on which all the corresponding messages can be retrieved;
- the Tagcloud, Members, statistics/graph sections of LDs group give information about the interactions around a LD specified by a tag;
- LD is shared on other social networks, specifying the link to the messages of LDs group related to that LD (retrieved using the specific tag).

Notes: it would be useful to specify a LD for each course/educational activity on cirip hosted in a group, which can be improved while running the activity, then share it in LDs group, and possible reuse; for each complex LD is possible to open a separate group on cirip.

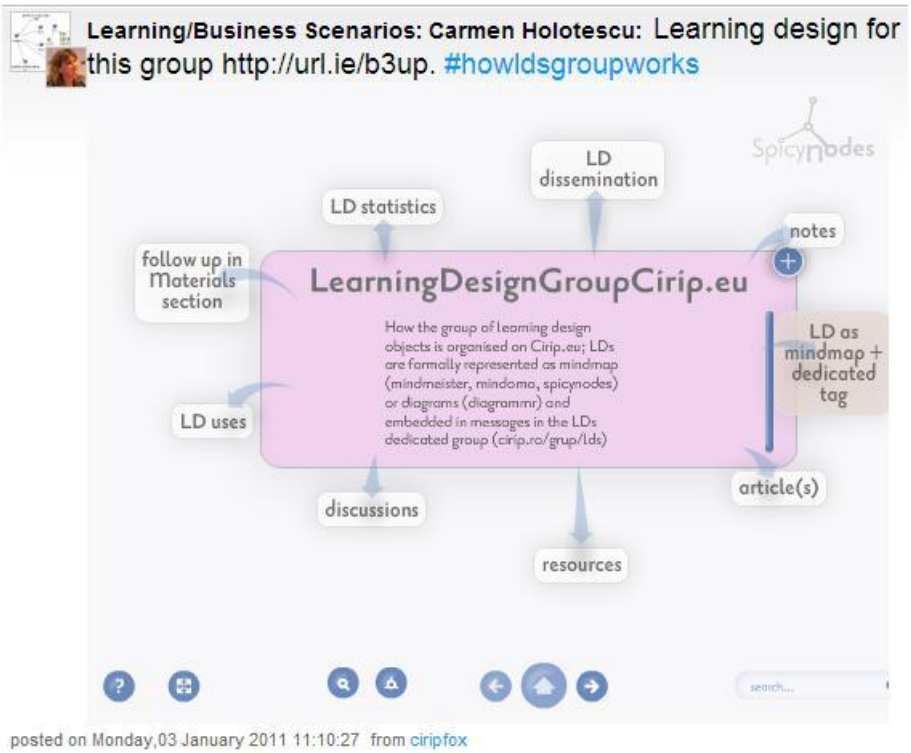


Figure 8.5.1. Learning Design object specifying how LD group works, note at cirip.ro/status/4360149

8.5.2. Learning design for academic courses. Bloom Taxonomy for Cirip activities

For modelling the courses using learning scenarios, the university courses hosted on Cirip.eu were the subject of analysis. During these courses the students learn and practice different Web2.0 technologies/applications, such as: RSS feeds, social bookmarking, social networking, blogging and microblogging, wikis, mashups, presentation and document sharing tools, images/audio/video creation/editing/sharing, mindmapping, screen recording, and digital storytelling.

In this manner, the dimensioning of learning scenarios, in order to identify primar impact elements in using the microblogging technology for study and learning, was based on establishing specific contents for each instruction level, in conformity with the recommendations noted by Cross and Conole (2009).

For the large category of learning activities on the platform we tried to readapt the taxonomy of Bloom (Churches, 2009).

Table 8.5.1. Bloom taxonomy rewritten for the on-line environment of cirip

Level / Category	Key words / Examples of activities
Remembering	**Retrieving**: messages can be sent and received online through Web, email, mobile, SMS / IM / Jabber / Gtalk / mJAVA, firefox extension CiripFox / iGoogle cGadget / ciripAIR, FF Ubiquity, Twitter account / from RSS2cirip. **Listing**: widgets on sites, notifications by email, SMS, iCIRIP. **Basic search** on different criteria; for each search an RSS feed is generated: • search messages - in all public messages, in personal messages, in accounts / feeds / current groups or in followed feeds / groups; • search users after different criteria at *Users* page (name, gender, location, microblogging domain); • search groups after criteria - at *Groups* page (name, moderator, type); • search feeds – at Feeds page (name, URL). **Social networking -** each microblog has a network section, displaying followers and followed users, groups and feeds. **Highlighting** through *Real-Time Wall* and *Timeline* **Locating/finding** with maps (see also http://www.cirip.ro/cirip/map).
Understanding	**Advanced searching** with **Twingly**. **Categorising** and **tagging** (see TagCloud sections for microblogs, groups, feeds). **Commenting** (see reply messages with @ and RC and email for an entire group). **Annotating**: bookmarklet button cirip (Send on cirip). **Subscribing** (RSS2cirip, monitoring RSS blogs, other sites). **Twittering -** Twitter integration (cirip2twitter, twitter2cirip – at message level, user (authentification) or for import to/from groups).

	Classifying/comparing (with *TOP* statistics, *Network* from each user microblog menu). **Summarising**: collaborative documents (voicethread, dotsub, mindmeister). **Collection/explanation**: mindmapping in courses strategy (in collaborative or individual settings) – mindmeister, mindomo, spicynodes, diagrammr. **Show &tell**: audio/video recording tools – vocaroo, seesmic and lifestreaming – qik.
Applying	**Loading**: any type of file (pdf, doc, xls, odt, etc). **Illustration**: capzles (historic tale construction application). **Screencapturing:** screenr, screenjelly, screencastle. **Presentation** with prezi, glogster, authorstream, capzles, notaland. **Interview**: any audio recorder – > mp3 files are embedded in messages; vocaroo, lifestreaming. **Uploading**: flickr, picasa, photopeach, youtube, vimeo, slideshare. **Sharing**: links (shorten), audio (eok, deezer, blipfm, trilulilu), video (youtube, vimeo, 220.ro, myvideo), presentation (slideshare, photopeach). **Editing**: dotsub, google documents (students can work in collaboration).
Analysing	**Polls and surveys** (polls and quizzes can be created and responses can be sent through Web and SMS, and poll facility from Photopeach and Google Form). **Mindmaps**: mindmeister, mindomo, spicynodes, diagrammr. **Graph** – any image (by URL) can represent the result of a graph utility, google drawings.
Evaluating	**Commenting**: @ replies and through RC. **Testing** (Quizz and Polls, google forms). **Moderating, collaborating, networking** – the user is turning into content creator / group facilitator.
Creating	**All** of the multimedia objects embedded in messages.

But **how** do we achieve the promotion of new teaching methods by using the learning scenarios? From the cognitive arhitectures described before, for constructing learning scenarios with final goal to the visible improvement of the student's motivation to learn, the aplications of cognitive maps detach (see Figure 8.5.2).

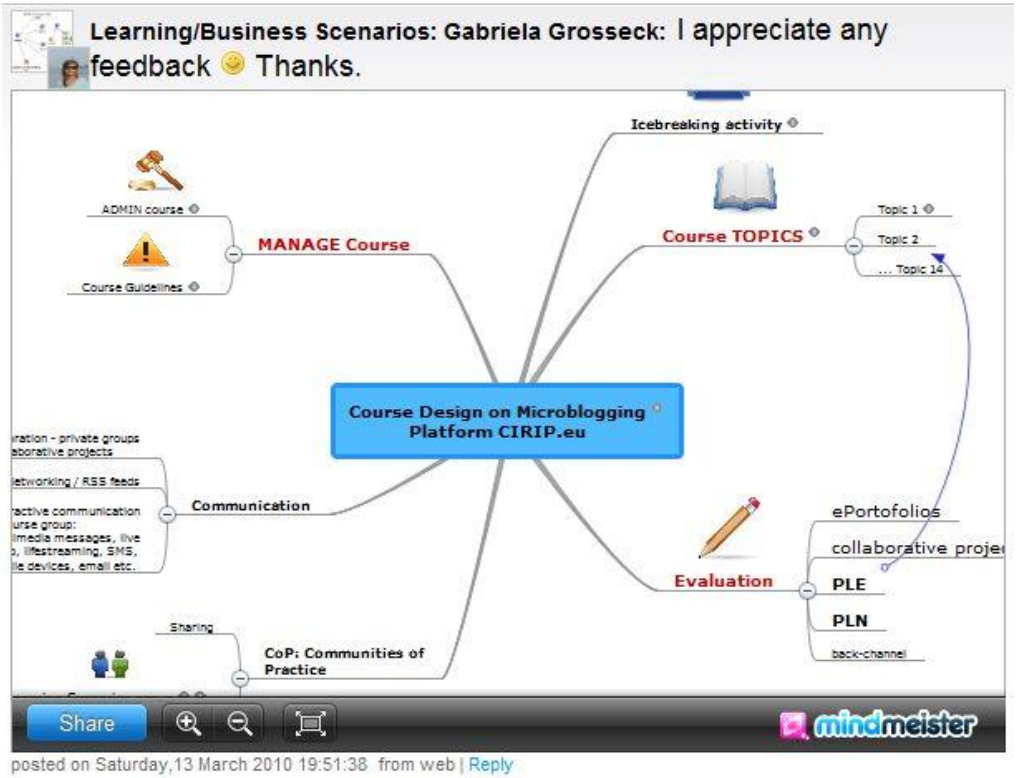


Figure 8.5.2. Learning scenarios proposed for a course, source http://www.cirip.ro/status/2488153

Note: We say this because we do consider that the success key in using microblogging in education is to be aware of the fact that there is a relationship between the student, the technologic environment / the platform and his learning activities / the education to use microblogging after the course end.

Like all communication and collaboration on Cirip, the LD group is an illustration of JP Rangaswami's metaphor: "Conversations grow around social objects, much like pearls grow around microscopic dust. Social objects are about growth, they are live"[71].

The group encourages peer-working and peer-mentoring in creating / recreating scenarios, but also in preparation and facilitation of courses and educational events. A teacher or facilitator can apply succcessful scenarios, and can be assisted / helped in facilitating the course by a more experienced colleague. Feedback will be brought in LD group, by teachers and participants for all member's benefit.

The immediate consequence of such collaboration was both rethinking the teaching process and learning activities / objects and redesigning the curriculum - see Figure 8.5.3.

71 http://confusedofcalcutta.com/2008/02/16/musing-about-social-objects-molluscs-that-matter/

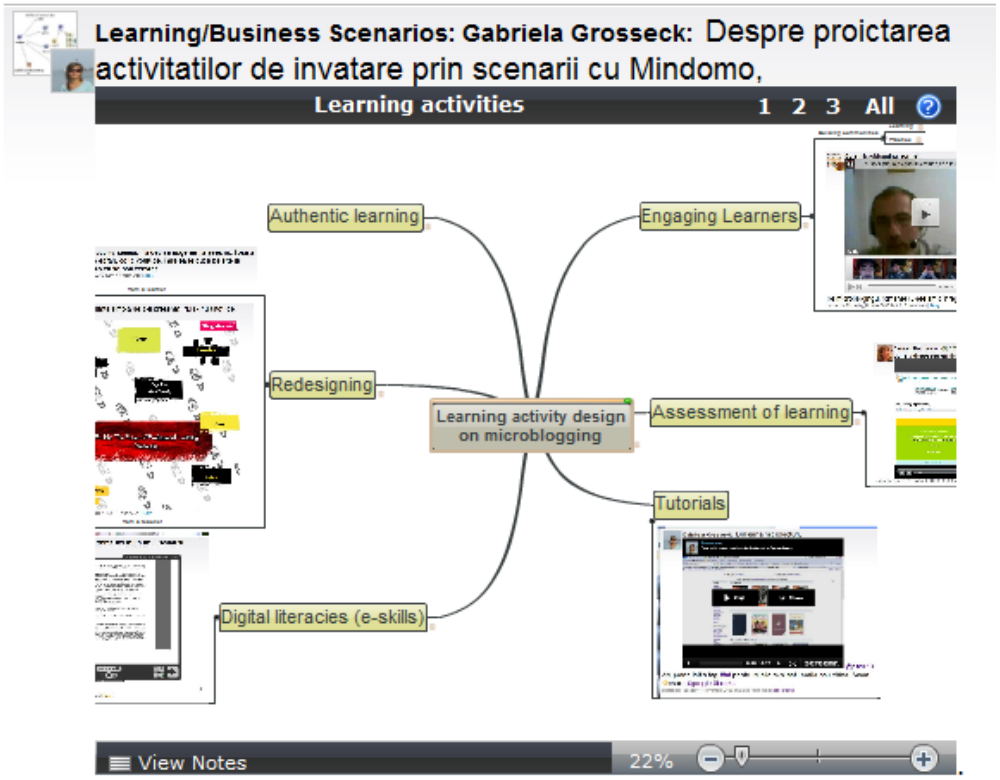


Figure 8.5.3. Learning activities design model, source http://www.cirip.ro/status/2497482

A Diploma thesis we have coordinated focused on creating a CompendiumLD2CiripLD desktop application for converting a CompendiumLD scenario into a Cirip LD object (Adam, 2010).

CompendiumLD is being developed as part of the Open University Learning Design initiative, and is currently funded by the Open University and JISC[72].

This way the experience of other communities of practice around LD can be shared on Cirip, enlarging the experience of teachers and practitioners who activate in the LD Cirip group/community.

72 http://compendiumld.open.ac.uk/about.html

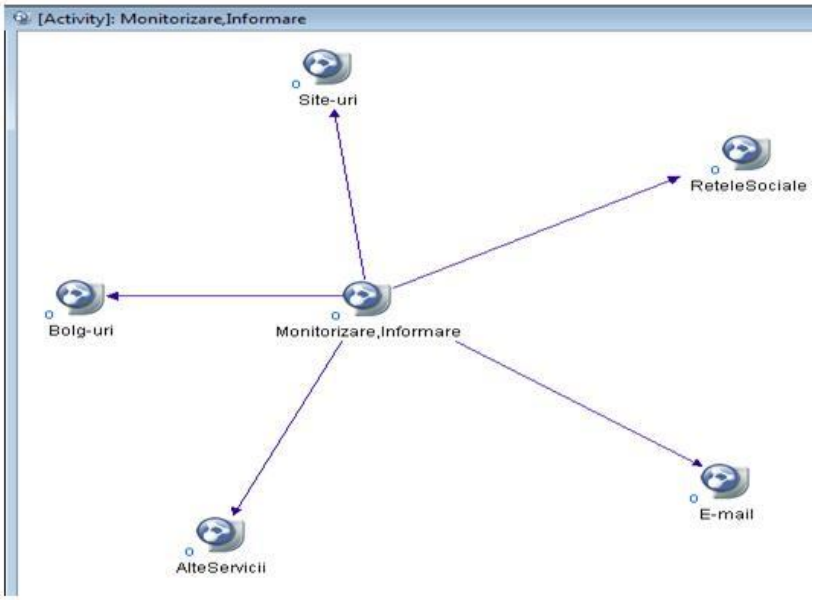


Figure 8.5.4. A part of a CompendiumLD scenario

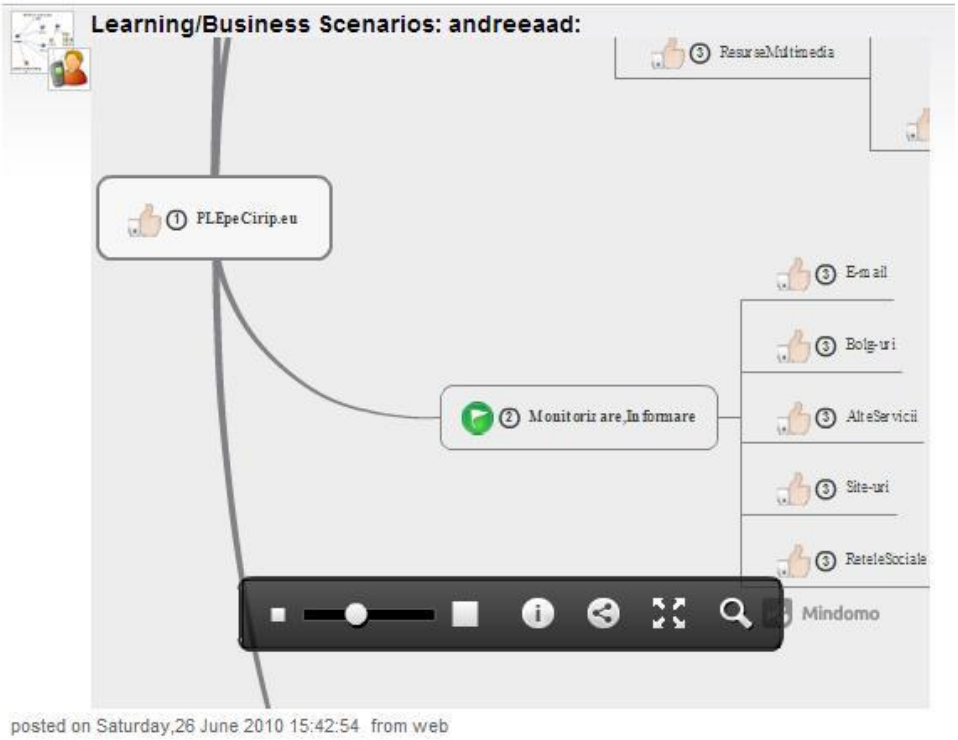


Figure 8.5.5. The corresponding Cirip LD object obtained with CompendiumLD2CiripLD, note at http://www.cirip.ro/status/3064095

8.6. Learning Analytics and Assessment Facilities

As presented in a previous chapter, Learning Analytics is a emerging field in education, having as purpose to identify, collect, manage and interpret learners' big data to improve the educational process.

Learning Analytics and Assessment facilities were implemented on Cirip, having as characteristics:

- data collected and analysed are related to learners activities in the courses groups, to the interaction / communication in other groups and with other users (external learners), but also on the Social Media platforms connected with Cirip
- the period of observation for a participant is longer than the period of a course, because usually a user remains active on the platform, building and consolidating his/her own PLE
- the aims are to personalize the learning process, to correctly assess learners activities, to give a prompt feedback and to improve courses using the experience/data gained in those already run.

In the following the data collected, the metrics developed, the methods to visualized them by students and facilitators are presented, together with a review of facilities offered by other social LMSs.

8.6.1. Projects for Social Media Assessment

The activity, participation and interaction of students on different social media platforms during courses cannot be assessed or marked by using traditional assessment strategies. Also, most universities don't offer assessment procedures guidance related to the identification, ownership, safety, privacy and record-keeping of such Web 2.0 work produced for assessment.

After a review of the existing assessment strategies for courses using different social media, we propose a set of microblogging metrics for assessing students' activity and learning communities' coagulation on microblogging platforms. The indicators were implemented on the microblogging platform Cirip.eu, facilitating student assessment in formal and informal courses, and observations on the moderation and quality of the courses. The set can be adapted for other microblogging platforms used in education.

This section is also meant to be a space for reflecting on several indicators of social interactions in the microsphere, indicators which may prove useful in research from the perspective of the discourse and the dynamics of establishing connections with others. We'll try to define, and to discuss several indicators of social interactions in the microsphere, indicators which may prove useful in research from the perspective of:

- the discourse and the dynamics of establishing connections with others
- the dimenssion and relevance of the developed PLE/PLN, and
- the ePortfolio.

The analysis will focus on the learning communities and the communities of practice developed on the microblogging platforms Twitter and Cirip.eu, but it can be generalized and extended to other implementations as well.

With the increased use of social media applications, a large number of universities worldwide are integrating them in the teaching-learning process, in research and in professional development.

During the last six years, the technology of microblogging has been adopted in a variety of contexts, its usefulness becoming more and more compelling for educational actors, in schools and universities, in training and workplace learning.

The activity, participation and interaction between students on different social media platforms (on microblogging platforms too) during courses cannot be assessed or marked by using traditional assessment strategies. Also, most universities don't offer assessment procedures guidance related to the identification, ownership, safety, privacy and record-keeping of such Web 2.0 work produced for assessment.

A few notable projects were developed concerning the best way to assess the students' work on social media and on microblogging platforms during courses, but an ongoing consultation between teachers and policy makers is needed.

Often used interchangeably with Web 2.0, social media have different forms such as blogs, microblogs, social networks, media sharing sites, social bookmarking, curation and social aggregation applications, wikis, virtual worlds, social games and other collaborative applications. The integration of social media in academia has marked a shift from eLearning to eLearning2.0, a term coined by Stephen Downes (2005), which implies:

- informal / social learning are integrated in formal learning;
- during courses, the learning community includes not only students and facilitators, but also peers worldwide;
- students build their own ePortfolios and Personal Learning Environments;
- the Learning Management Systems (LMS) are enlarged by using Free and Open Source Software (FLOSS), Open Educational Resources (OER), collaborative content and interactions on Web 2.0 platforms/applications, such as blogs, wikis, RSS, podcasts.

Many reports and research studies emphasize the advantages of using social media in education: reflective, creative, collaborative and peer work is encouraged, positive impact on students' retention, digital skills are cultivated (Conole and Alevizou, 2010; Grosseck and Holotescu, 2012e) "development of competences for lifelong learning and employability" (Starcic and Turk, 2010).

The evaluation and grading of students' activity, participation and interaction on different social media platforms during courses cannot use traditional assessment strategies. To build and to assure quality assessment strategies and practices, in line with the courses curricula and learning objectives, are complex, challenging and demanding tasks arising from factors such as:

- the content can be collaboratively created not only with peers enrolled in the same course, but also with external learners and contributors, and can be distributed on different platforms too;
- each student's work has to be identified, also safety, privacy and record-keeping have to be assured (gray et al., 2010);
- issues of copyright and ownership have to be taken into account;
- "if the instructions given to the learners are not clear and explicit in terms of what is expected, the management burden for the instructor can become overwhelming" (Conole and Alevizou, 2010);
- peer and collaborative assessment have to be integrated.

In the following, we will briefly review some notable projects related to assessing students in social media enhanced courses. Although the projects don't refer specifically to microblogging, they can be useful as well for teachers and educational actors interested in assessing students' activities on microblogging platforms.

After analysing 17 selected cases, where academics have set assessable activities, establishing an inter-relation between learning objectives, assessment tasks and marking criteria, Gray et al. (2010a) make recommendations for a quality assessment:

- integration with other elements and forms of assessment should be clear;
- is linked to specified learning objectives;
- produces evidence of desired learning outcomes;
- is supported by adequate instructions and marking rubrics;
- encourages academic honesty;
- provides explanatory and diagnostic feedback;
- enables peer review and moderation of marking;
- can be externally evaluated for curriculum accreditation and recognition of prior learning.

Another work of Gray et al. (2010b), also part of the "Assessment of student web 2.0 authoring" Edna Project[73], contains good practice guidelines, in the form of three checklists:

- an affordances checklist, to support an appropriate fit between what web 2.0 activities entail and what assessment is trying to achieve;
- a processes checklist, to support individual and organisational learning throughout the cycle of assessment activities;
- a policies checklist, to support practices that make assessment safe and fair for students and staff.

Assessment 2.0 (Tinoca, 2011) is another valuable research work, which defines e-assessment as "all technology-enabled assessment activities where the design and student activities (complete, present, submit) must be mediated by technologies." The conceptual framework for e-assessment addresses four dimensions: authenticity, consistency, transparency and practicability.

8.6.2. Indicators for interactions in microblogging communities

Popularity

This indicator can be obtained easily and is based on the relation between the number of followers of a user and the number of messages sent.

For Twitter, the determinations of this indicator can be obtained with mashups such as Twitterholic, Twitter-Friend, Friend-to-Follower-Ratio and so on. In the case of the Romanian Twittosphere, the Ze List application has a special section[74], where classifications can be consulted according to the number of followers, of persons being followed and of the number of messages written during the last week.

On Cirip.eu popularity may be analyzed on the *Users* page, which allows listing according to the number of messages written, but also according to the ratio between the followers and the number of messages written.

Influence

Influence is probably the most visible indicator in the case of an analysis, both in an educational and a business context.

In the case of Twitter microblogging platform, a series of applications have been developed, whose use must be handled with certain precaution and/or a qualitative analysis. Examples:

73 Edna Project http://www.groups.esa.edu.au/course/view.php?id=2146
74 http://www.zelist.ro/zetweety.html

- Twitterholic or TwitterCounter: lists the classifications of users according to the number of followers (although Barack Obama leads the classification, he has only a few messages posted in comparison with Chris Brogan or Guy Kawasaki, who don't even enter top 10).
- TwitterRank: a sort of Google Rank for messages, updated every 20 minutes, based on an algorithm which takes into consideration the number of answers received by a user (i.e. those messages with @user_name which practically transform Twitter into a huge semi-public conversational sphere) and offers a more realistic classification than those of Twitterholic or Twittercounter.
- TwitterGrader: developed by the marketing company HubSpot, it takes into account the number of followers, the power of the network they create, the rhythm of the postings, the degree of personalization of the profile, but also other factors.
- Twinfluence: is based on several very interesting metrics such as the social capital, the first and second order network, the increase speed of the network, the concentration, the access and the influence sphere of the network.
- TweetValue: (with a funny feature) quantifies from a monetary point of view the value of one's own profile. It is based on followers and answers.

The authority level on Cirip.eu can be followed on the *Tops* page, where hierarchies appear according to the number of messages, persons being followed, and followers, answers received and sent. The focus of a user in a classification will display the characteristics for that top, making its position visible in the other hierarchies.

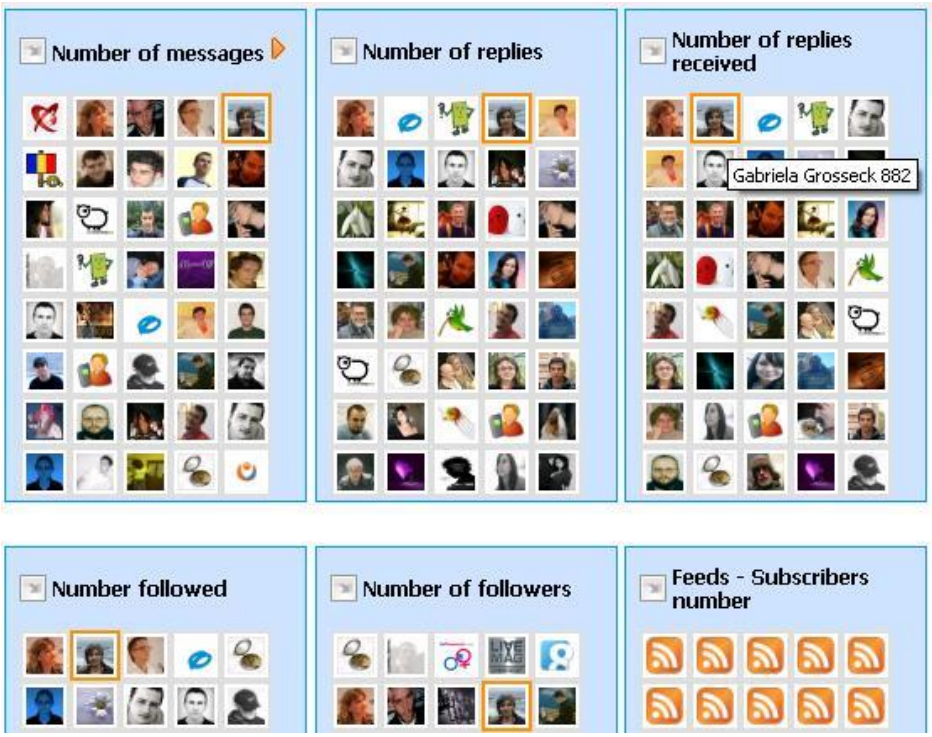


Figure 8.6.1. Tops page on Cirip.eu

Coagulation index

We define this indicator by *subindexes*: the covering / density of the network, the conversational coefficient [75], the reciprocity and the relevance.

The *network covering* takes into account the messages sent and received, including also the messages addressed with @user.

For example, for Twitter, the analysis of usage habits can be realised with the help of the TwitterFriends application. This is based on the existence of three networks: the *general* one, made up of people you follow and of those who follow you, the network made up of the followers of your own followers (*„your friends' friends*") and the list made up of those persons with whom you chat most frequently (*„the hidden part*" of the conversational chain). For the received messages (or those referring to the user in the message) only the last *30 days* are taken into account, and *at least 2 messages addressed with @.*

Figure 8.6.2. Network covering for the user cami13, http://twitter-friends.com/?user=cami13 (screenshot from feb. 21st 2009)

The conversational coefficient, introduced by the Twitter-Friends creator (@furukama), registers the number of messages received / sent and that of the Web resources posted in messages, displaying them both as percentages and visually, under the form of a cloud (tagcloud). In Figure 8.6.3 the double arrow indicates more or less regular discussions with conversational partners (who may not belong to one's personal network). Global indices are also reported in the statistic data (both for the conversational and relational level and for reposted messages).

75 It remains to clarify in the future to what degree we may consider the coefficient of posted relations a subindex.

Figure 8.6.3. Visual representation with Twitter-Friend for the Twitter account @cami13

Reciprocity is found in the degree of „mutuality" of the relation with another user / other users.

> *„In my account there is a certain disequilibrium between the number of persons I follow and those who follow me. A large number of followed persons requires an effort of attention, energy and a time budget that I lack. We simply cannot be connected with everybody"*
>
> *@gabriela, www.cirip.ro/u/gabriela*

Relevance refers only to the network made up of the persons you follow and who follow you, this depending a lot on how microblogging is perceived: as an informational or a relational network. If you want to keep informed, then you would probably have a larger number of persons you follow (whose activity is closely connected mainly to your professional field). The analyst Valdis Krebs[76] states that in the construction of a relevant network it is important to follow people who have an important social circle, practically a user employs the redundance of connections for obtaining a relevant network. He indicates a number under 100 followed persons (of which 50 persons are definitely enough if you really want to read each message posted and another 20-30 just for the sake of the conversational bustle). Others refer to Dunbar's number and indicate a circle larger than 100. Valdis Krebs also states that visualizations of relational networks as maps are like metaphors and are not *accurate, correct, current, perfect* representations of one's own social circle.

Question: is the number of followed persons directly proportional to the number of posted messages? To what degree does this matter when you decide to follow a certain person? Because applications like Tweedeck and Twirl allow the creation of groups by interest zones, and things seem to acquire a completely different connotation or, according to Beth Kanter's words, in her comment to Krebs posting: „So, the dipping is like sharpening a pencil or way of finding some inspiration or a different way of thinking."[77]

> *„Time wise there isn't necessarily much difference between 100 to 1000. Weird as it sounds I'm considerably more time efficient following more than I was with less. What changes is the nature of the conversation, less than 200 feels considerably more intimate but more than 200 provides more diverse idea exchange plus greater chance of faster assistance."* Sue Waters[78]

76 http://www.thenetworkthinker.com/2009/01/so-many-people-so-little-time.html
77 idem
78 ibidem

As for the Cirip.eu platform, the *Network* section of a microblog offers information on the network developed around that user, displaying:

- the followed users: in blue if the relation is mutual, grey only if the current user follows someone;
- in red – the followed groups;
- with dotted line – users who follow the current user, without being followed.

For each user in the network, the last written message is displayed, along with the direct messages counter he/she exchanged with the central user.

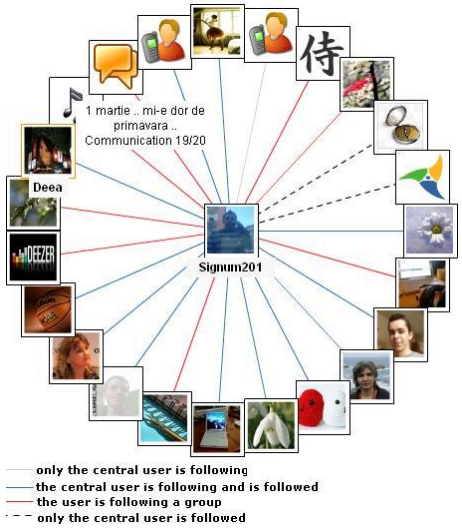


Figure 8.6.4. The network of a Cirip.eu user

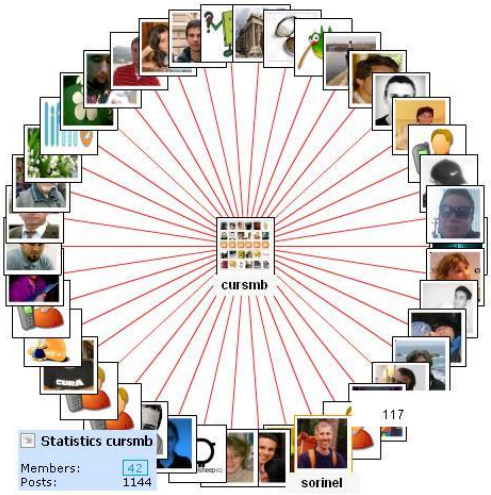


Figure 8.6.5. The Cirip.eu group development network for the microblogging course

By analyzing the network, some interesting remarks concerning the *conversational coefficient* can be made:

- we can look for the *cause of an unbalanced communication* with some of the network users, if the number of sent messages differs largely from the received ones. Figure 8.6.4 illustrates a balanced communication between Signum2001 and Deea: 19/20;
- if there's a *direct communication* with a user who only follows, without being followed, it is probably useful that following becomes reciprocal;
- we can analyze the number of users outside the learning / practice community belonging to a participant's network, the topics dealt by the latter (the field could be mentioned in the description of each microblog), direct communication and so on. A first conclusion refers to the expansion of the PLE/PLN, the existence of discussions, the validations beyond the learning community, these being only some of the advantages brought by microblogging;
- similarly, we can evaluate the number, topic, participation to other groups, than the one for a course or those for collaborating with colleagues; thus, there is the possibility of discussing, learning, approaching other interest topics, for study or research.

The total number of a user's messages addressing other persons can be found by searching @ in his/her messages. The relation between the addressed messages and the total number of messages represents the *conversational*

coefficient, which should be as large as possible, around 50%.

By searching @user in all messages, the total number of messages received from others is determined. It is advisable that the messages addressed to other users and those received should be close, indicating a balanced interaction at the level of the entire network built by that user.

For a group, the Network lists the members and the number of messages written by each of them. The causes of a different participation or motivation in a course group can be searched, for example: a deficient moderation of the facilitator, the lack of certain attractive interactive activities, unclear issues about the functioning of the platform, etc.

Exposure index

This indicator is built starting from the set of the discussed elements, taking into consideration the topics approached by a person on her / his microblog.

Figure 8.6.6. The group tag cloud of the microblogging course

The hashtags.org site indexes #hashtags (ketwords preceded by #), making them visible to other users. Practically, these hashtags belong to the content generated by users, being initiated / chosen by users (they are not imposed)[79]. On Cirip.eu, the exposure index can be analyzed starting from the group and user tag clouds:

- the most frequent terms, the users who received most messages, the most discussed resources (a click on any term will display the messages including it – see figure 8.6.6);
- in the case of a learning community, the fact that some curricula keywords do not appear in the tag cloud may indicate the necessity of insisting on those chapters in the future;
- topics beyond the initial course curriculum may be discovered, which can be included in future courses or which can be suggested as topics for group projects.

Thus can be initiated subsequent analyses starting with the most active

79 More information can be found on the wiki http://twitter.pbwiki.com/Hashtags (those interested can follow these at http://twemes.com).

members, nouns, verbs (meaning the notions on which the discussions and group activities are focused), the degree of participation (group, everybody), the warm and open atmosphere (hello, thanks) etc.

Geographical distribution

The best way to understand complex data structures, the relations established within a network, the dynamics or the interactivity of a community is by their graphical visualization.

The *geographical indicator* suggested analyses and exposes in a graphical form the signs of our online presence, thus practically drawing up a social map under continuous expansion, showing in detail the ways in which we interact and expose ourselves in a public space[80].

This is allowed by Twitter applications such as TwittEarth, Twittter Spy, TwitterVision, TwitterPoster etc.[81]. From the two Romanian microspheres the messages appear in a Google Maps mash-up, under the Map section of Cirip.eu (see Figure 8.6.7).

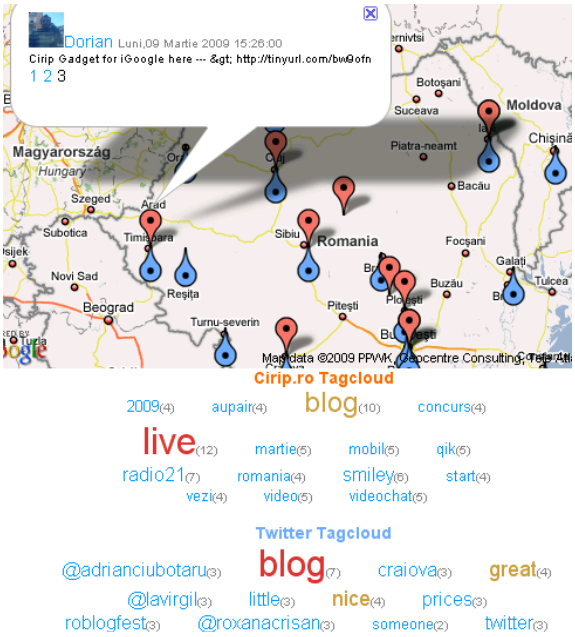


Figure 8.6.7. For the visualization of the tag clouds the Map section is used (Cirip.eu)

As a consequence to what we presented previously, we can define a *global conversational index* through the perspective of the subjects approached entirely on the two microspheres: the Romanian Twittosphere, and the Ciriposphere respectively (Figure 8.6.7).

80 Miron Ghiu, http://twitter.com/nomaduzzu

81 See for details http://blog.twitter.com/2008/03/visualizing-twitter.html and http://flowingdata.com/2008/03/12/17-ways-to-visualize-the-twitter-universe/

Temporal distribution

Although the conversational model focuses on the pragmatic and structural aspects of the conversation, the temporal distribution of participation can be followed in the *timeline* section of a user microblog on Cirip.eu (Figure 8.6.8). Similarly, we can follow the distribution of messages sent within a group.

For Twitter one can use applications such as TwitterTimeLine (http://twittimeline.come.cc/) or TweetDumpr.

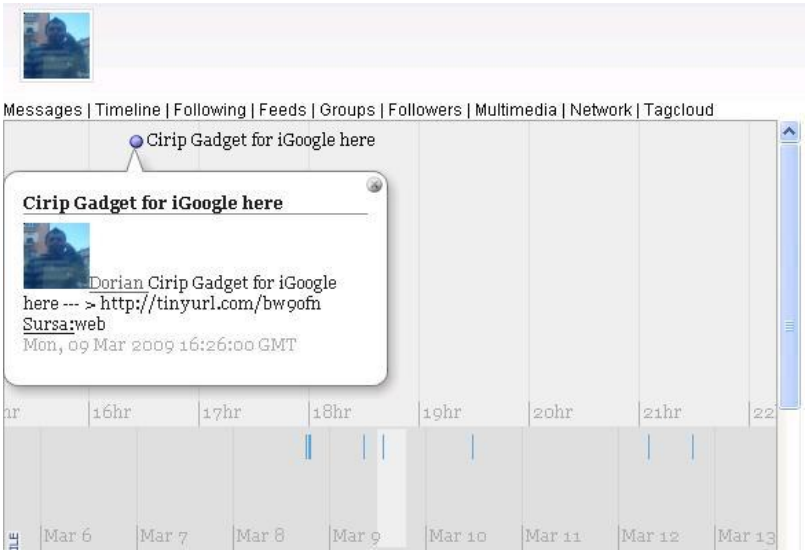


Figura 8.6.8. Timeline of a microblog on Cirip.eu

Online social presence

In 2005 Jyri Engestrom, the co-developer of the Jaiku microblogging platform, launched a theory stating that, in most of the cases, people base their relations on certain objects, which he named *„social objects"*. These can be both physical, such as „location", and semi-physical (such as „attention") or even conceptual, such as *„on-line presence"* (Engestrom, 2005). Engestrom claims that people don't interact with each other, but rather by way of certain objects imposing a commun value. According to this theory, which seems extremely flexible when approaching online social networks, objects become the centre of any social relation and the nucleus/fundamental notions of a (strong) social network.

Networks can thus be formed around these objects, connecting people with objects, objects with people, objects with objects and, perhaps, people with people. In microblogging, the social object is clear: the online presence, i.e. what you want to do online. The lifestream can be supplied online or in various ways, from using a desktop or mobile client, to more automatic entries by adding an RSS feed to the microblogging service used (TwitterFeed). The expansion of the presence status can be met, for now, only on Cirip.eu microblogging platform. Thus, *the structural diversity of PLE/PLN* with networks of educational resources which can be integrated in messages, represents a specific analysis element which includes:

- objects selected from networks and included in messages as useful resources;

- objects created by the user in question – which can be saved in the *Multimedia* section of the microblog, as a personal resources directory;
- other people's reactions, comments, useful in assessing the relevance of the resources.

The microsphere analysis indicators such as the level of influence and trust and the informational flux, the economy of interactions, the discipline of communication, the linguistic range, the context and texture aspects of conversation, etc require the attention of several factors (the structure of the relations, the analysis of feelings/emotions, the conversational structure, the classification of topics of temporal analyses) and the focus on messages, and users respectively. Although the latter have not been included here, they are subjects that, in our opinion, could open a new chapter dealing with the study of the relations within communities built on microspheres.

8.6.3. A Set of Microblogging Metrics for Student Assessment

In this section we will present a set of microblogging metrics that were implemented on the microblogging platform Cirip.eu. The indicators can be used for the formative and summative assessment of students' activity and learning communities' coagulation on microblogging platforms:

- *popularity*: relation between the number of followers of a user and the number of messages sent
- *influence*: based on the number of followers and the distribution of one's own messages (referenced or resent)
- *coagulation index*: the covering / density of the network, the conversational coefficient, the reciprocity and the relevance
- *exposure index*: set of the discussed elements, taking into consideration the topics approached by a person on her / his microblog
- *geographical distibution*: analyses and exposes in a graphical form the signs of our online presence, thus practically drawing up a social map under continuous expansion, showing in detail the ways in which we interact and expose ourselves in a public space
- *temporal distribution*: messages distribution on time
- *online social presence*: type and quality of messages.

Some interesting remarks can be noted on the interdependences between:

- the types/the complexity of objects integrated in messages
- the types of communication – public/ private group, learning/ hobby/ business/ socializing; as an example, personal audio/video interventions appear mostly in private groups
- the coagulation degree of the community
- the facilitation of the group moderator
- web-based access and mobile access.

Dedicated extensions and statistics were implemented on the Cirip.eu platform in order to support the assessment metrics. The *Network* section of a microblog offers information about the community developed around that user, displaying:

- the followees;
- the groups followed;
- the users who follow the current one, those who are not followed being marked with a different colour.

For each user in the network the last message written and the number of direct messages exchanged with the central user are displayed.

The *Network* section of a user / group displays also a series of statistics, which facilitate the analysis on various research directions:

- the activity
- the relations formed
- the interests
- the means of participation
- the content of messages.

The statistics of a student's participation or of a course group can be compared with the statistics of similar courses. The study of other courses' scenarios published as Learning Design objects in the Cirip specific group can give teachers some guidance for a better facilitation and structure of the course.

By analyzing the network, some interesting remarks concerning the *conversational coefficient* can be made:

- we can look for the *cause of an unbalanced communication* with some of the network users, if the number of sent messages differs largely from the received ones;
- if there's a *direct communication* with a user who only follows, without being followed, it would probably be useful that following becomes reciprocal;
- we can analyze the number of users outside the learning / practice community belonging to a participant's network, the topics dealt by the latter (the field could be mentioned in the description of each microblog), direct communication and so on. A first conclusion refers to the expansion of the PLE/PLN, the existence of discussions, the validations beyond the learning community, these being only some of the advantages brought by microblogging;
- similarly, we can evaluate the number, topic, participation in other groups than the one for a course or those for collaborating with colleagues; thus, there is the possibility of discussing, learning, approaching other topics of interest, for study or research.

As an example, examining the Network section of the microblog developed by the user @gabriela, some observations can be drawn.

A good ratio between the number of followees (170) and followers (225), sub-unitary, but close to 1. A large number of followers indicates the utility of messages and interaction with @gabriela, while a large number of followees the interest to learn, to collaborate. Around half of the followees follow her too, which indicates the development of long-term collaboration relations.

The statistics of the Network section lead to the conclusion that there is an active participation and interaction within the Cirip.eu community. The same situation is shown by the data in the section Followed Groups: collaboration across a large group area.

The large number of resources posted in messages (2730) indicates a considerable quantity of information shared with the other users and many information sources (35 RSS feeds).

More than 50 audio files, around 300 images of all types, 400 video files and more than 200 files (mostly pdf) and SlideShare, VoiceThread or prezi presentations show that the user @gabriela uses the entire range of multimedia object types provided by the Cirip microblogging platform.

The interaction with the other participants was realized by using all technologies and applications for interaction with the platform, including mobile ones.

The integration of social media, in particular microblogging, in academic courses demands a new pedagogy of the teaching and learning process and a rethinking of student assessment. "It is not only about bringing into education a set of new tools and technologies; it is about a change in the learning ethos. And the way in which such learning is assessed needs to be consistent with this change in learning philosophy" (Online Educa, 2010).

The microblogging metrics defined for the Cirip.eu educational microblogging platform can be applied both for summative and formative assessment, and can be adapted for other microblogging applications used in education.

As future development we aim to integrate the Learning Analytics for Cirip courses with existing institutional metrics and reporting mechanisms.

Following: 170
Followers: 225
Following-Followed relations: 80

Messages:
Total number of messages: 4844
Replies: 1867
Sent to users: 1259
- public messages: 1116
- in groups: 143
General messages: 3585
- public messages: 3028
- in groups: 557
Sent in groups: 700

Followed groups: 35
Max participation in group Carmen - Gabriela (@carga) – messages: 417
Min participation in group Bloggers in Timisoara (@BloggersTM) – messages: 4

Interests:
Links in messages: 2730
Monitored feeds: 35

Multimedia objects embeded in messages:
Audio: 61
Images: 288
Videos: 386
Live Videos: 9
Presentations: 220
Files: 218

Messages sent on/by:	public	groups
Web	2468	499
SMS	29	13
CiripFox	98	78
Twitter	578	0
E-mail	12	7
RSS2Cirip	695	0
CiripAPI	12	6
CiripAIR	1	1
GoogleGadget	2	1
CiripME	0	0
Ubiquity	7	2

Followed by:	users	groups	feeds
SMS	3	3	2
Jabber	2	0	0
E-mail	173	35	39

Figure 8.6.9. Statistics for the user @gabriela (source: Network section of cirip.ro/u/gabriela)

8.7. Conclusions

This chapter presents the Cirip features as a Mobile Social Learning Management System (msLMS): Learning Management and Mobile Learning features, how Social Objects are integrated as (small) Open Educational Resources in the platform flowstream, how Learning Scenarios can be specified as Learning Design Objects, and also the facilities designed / implemented for student Assessment.

Each group of Cirip acts as a msLMS, having a has a specific *groupname* which appears in its URL (http://www.cirip.ro/group/groupname). Also, the *groupname* is used to post a message in that group (syntax is *@groupname* for messages sent from the browser interface or just *groupname* in a text message). The group virtual space preserves the whole materials/interactions of the group members.

Its virtual space represents a simple, efficient, adaptable and scalable solution for:

- course in a university/college;
- company training;
- community of practice;
- team collaboration and management;
- space for mentoring/coaching;
- service related to an application/product;
- event: workshop, conference, etc.

The features of the platform was added in an incremental cycle, in the second phase of the DBR development (Figure 2.3).

8.7.1. Contributions

With a centralised architecture described in Chapter 7 and developed using a DBR approach under our coordination starting from 2008, Cirip has a number of unique features not implemented by other microblogging platforms.

These characteristics are specific for a Mobile Social Learning Management System and were presented in this chapter; all these represent ***technological innovations***:

1. creating public or private user groups; collaboration groups can be established between the members of a class or a university year, for a course enhancement or to run an entire course; for a conference, event, workshop, etc.; in a specific group section, the moderators can post announcements and materials, also can send alerts via SMS/e-mail to members; with sections for group announcements, materials, statistics, a group becomes a social Learning Management System (sLMS), engaging students in Problem Based Learning (PBL), case studies, and collaborative projects ;
2. the possibility to embed multimedia objects in the notes: images, audio and (live) video files, presentations, files, livestreaming, which can function as mini-lectures; the platform integrates a wide range of Social Media content, organized around (open) educational resources; this integration is realized in order to encourage teachers and students to

discover/explore/use new platforms, and to use their content; in perspective to (collaboratively) create content/educational resources on these platforms;

3. scenarios for learning and new pedagogical approaches in using Social Media in education can be captured and formally represented as learning design objects; the learning design objects can be shared, discussed, improved, and reused on the microblogging platform;
4. the possibility to monitor RSS feeds for sites/blogs/activities on other social networks or search feeds; Cirip remains one of the few RSS aggregators, the notifications can be monitored online, using a mobile browser or received as free SMSs;
5. tags, statistics, personal and group tagclouds, representations of users' interaction networks;
6. Learning Analytics and assessment features integrating learners activities in courses but also informal interaction with other groups / users and activities on the Social Media platforms connected with Cirip; microblogging metrics applied both for summative and formative assessment;
7. polls and quizzes which can be answered online or by SMS;
8. export and import (based on optional search terms) notes to/from RSS feeds, Twitter, blogs and other Social Media platforms, thus enlarging a user profile or a group content;
9. specific mobile learning features.

The ***conceptual innovations*** are:

1. the openness toward Open Educational Resources (OER) and Open Educational Practices (OEP);
2. the implementation of Social Mobile Learning Management Systems as public/private groups on a microblogging platform;
3. the integration of objects created on other Social Media platforms/collaborative technologies, and the connections to these environments;
4. the specification of learning scenarios as Learning Design objects which can be shared, discussed, improved and reused.

Chapter 9. Case Studies for Platform Validation

9.1. Introduction

During the last seven years the platform has being used in many educational projects (Figure 9.1.1), the most interesting being exposed here: for Online Courses and Courses Enhancement in high schools and universities, for Learning from the Stream, for integrating MOOCs in Blended Courses, for Teacher Training, for developing Personal Learning Environments, for Curation, and also for Monitoring Civic Events, such as the Romanian Presidential Elections in 2009.

Each case study presents the possibilities offered by other microblogging platforms for that particular usage and also the advantages and drawbacks of Cirip. All these case studies are part of the third DBR phase, aiming at testing and refinement of the platform, also at reflecting and innovating open pedagogies.

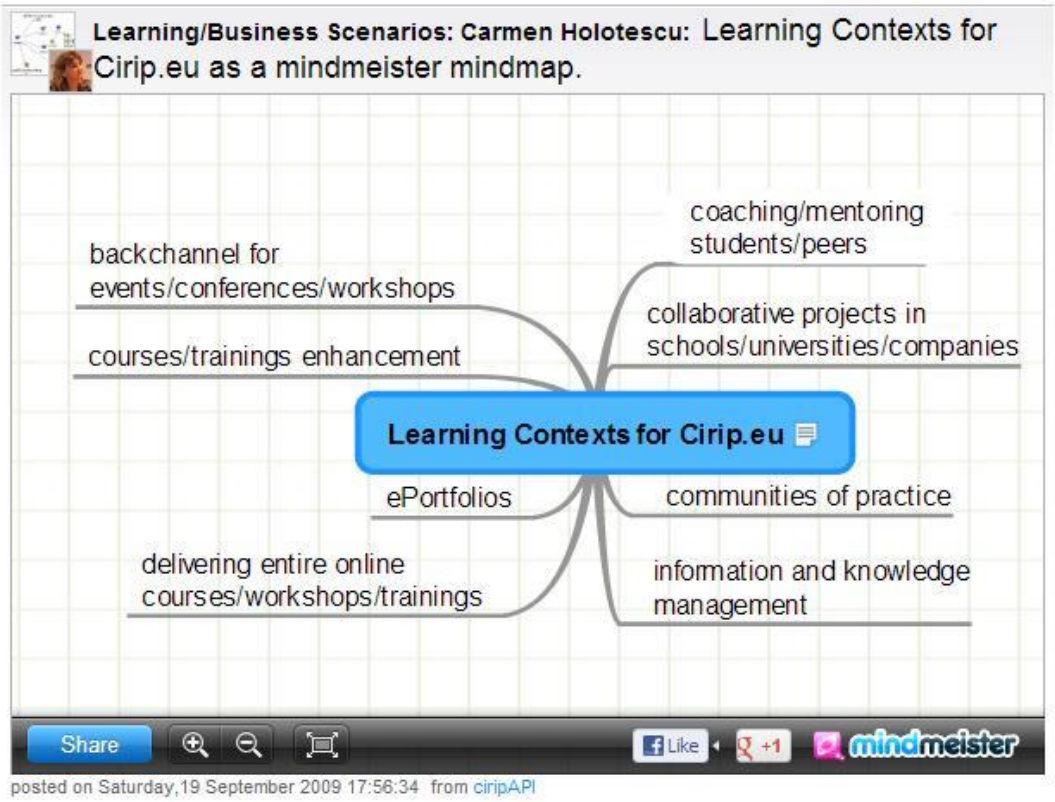


Figure 9.1.1. Learning contexts on the platform; note at http://www.cirip.ro/status/1629510

Table 9.1.1 illustrates the usages of Cirip in different educational activities and contexts for which we were the facilitator, mentor or manager; the names of the groups that hosted the specified activities are listed.

Table 9.1.1. Educational activities on Cirip

Number	Type of educational activity/context	Description	Groups
1.	Online courses/workshops for universities	Groups for delivering online courses/workshops for universities;	iac, socialmedia, seminar
2.	University courses enhancement	Groups for enhancing university courses: announcements, materials, discussions, students activities and assessment;	grupuvvg, siac, progweb, slavici, mps, curspc, uvvg13, peda2, peda09, psiho2008, mru, mpot, sts4man, sts4cig
3.	High and primary school courses enhancement	Groups for enhancement of course taught in high and primary schools;	france, klasse, prima, spitze, deutch, toll,
4.	Online courses for companies/individuals	Online courses developed and run for companies or individuals;	lideea, cursmb
5.	Project groups	Groups used for collaboration of the partners in European projects. Used also for projects dissemination;	3lwelfare, wetentm, taccle2, sutraproject, insightProjectLLL
6.	Collaborative spaces	Groups used for internal comunication and collaboration of teams in companies, institutions;	timsoft, proiecteposibile, prpatrat, carga, telpark, eta2u, scada, poka, evensys, cargo, voxline, tmf
7.	Training of trainers	Courses for training of trainers;	wetentm, iac, taccle2, smis
8.	Communities of practice	Collaboration of group members working on a specific topic/project;	lds
9.	Smart city projects	Activities related to smart city projects;	masca, teatrutm, ro89, prezidentiale
10.	Conference/events backchannels	Interaction around resources and real-time multimedia notes sent by in-site and off-site participants in different conferences and events; follow up activities;	ciripMeet1, eduCirip, timetravel, mbc09, mobile, geekmeet1tm, ntec09, tweetmeettm, solutiicriza, icl09ws05, itschool,

			ecollab, seedcamp, pelc10, plebcn, socialmedia, somobnet, smis, else, co11, smart2013, tedxtm, miss, seminar, smsummit, conkfc, itfest, me09, castel, besttim
11.	Students coaching/mentoring	Interaction with students preparing their graduation and master thesis. Mentoring pupils preparing for exams;	diploma, competentedigitale2010
12.	Students/pupils peer work	Private groups for communication/collaboration of students/pupils;	togetherG, osut, ligaAC, aiesectm, pldiploma, fjsc, happyclass/scoala (communication between kindergarden/school and parents)
13.	Informal/hobby activities	Resources and interaction about education, haiku, technology, music, books, games, sport, celebrations, design, photo, tourism, movies, etc.	scoalaideala, unhaikupezi, roSpore, clickandplay, techgeek, bloggersTM, bloggeri, diete, march09, eurovision, colinde, povesti, citate, paste, cecitesc, decoratii, myxmastree, euro2008revistaprese i, design101, mymusic, muzica, gadgetbuzz, arla, revistaTus, fotografie, foto, proturist, movietime

9.2. Online Courses and Courses Enhancement

There are already an important number of courses which were run for different universities or for continuous education during the last 7 years.

The first one was delivered in June, 2008, in a private group of Cirip.eu. It was *a world premiere*, *the first online course developed and run entirely on a microblogging platform*.

It was a course about Microblogging, and its aim was to find out if this technology can be integrated in the lifelong learning / teaching / collaboration /

business / blogging. The topics addressed were: microblogging platforms, Twitter facilities, Cirip.eu facilities, uses in education, uses in business, and uses in blogs promotion.

We wanted to investigate:

- how to integrate microblogging with other Web2.0 technologies;
- if a microblogging platform, in particular Cirip.eu, can be used as a Learning Management System (LMS), and if it has the needed facilities to run an online course;
- what are the differences between facilitating an online course on such a platform and one in a classic LMS.

9.2.1. Course Virtual Space – Group Facilities

The course was hosted and run in the private group cursmb of the microblogging platform Cirip.eu.

A group has a special section for announcements (*Group News*) - another original element of the platform, where the moderators can post notes and useful materials for the group activities (Figure 9.2.1).

The facilitators have published in the announcements both notes on the proposed activities and course resources: mainly tutorials on course topics, with a variety of multimedia elements, imported as SCORM/LOM objects.

The discussions on the proposed themes were realized through messages sent by the participants in the group space. Messages can be sent / monitored online (web site or CiripFox – a Firefox extension) or as: SMS (it's simple to track the group messages via mobile phone); instant messages; e-mail (daily notices with followed messages, answers, new followers or news are received by those who activate this option); it is also possible to send e-mail messages on Cirip.eu, including in groups.

Other valuable options are the facilities to send live video / audio messages and to integrate multimedia objects in the notes; all of them become part of the information / communication flow :

- audio clips saved on a server or vocaroo;
- flickr or tinypic images;
- youtube, seesmic, vimeo or dotsub videos;
- slideshare, voicethread, capzles, notaland, photopeach or flowgram presentations;
- pdf, docs or spreadsheet files.

Also the students learn how to find/use/create educational resources on the corresponding social networks. Their digital skills are improved, and their PLEs/PLNs are enlarged with these networks too.

Besides discussions and debates conducted by the wide range of messages we carried out a series of collaborative exercises, which will be presented in a separate section.

Figure 9.2.1. Group news, http://www.cirip.ro/grup/cursmb

9.2.2. Participation in Discussions

Although initially 50 people have registered, 40 of them have actively participated. The participants were mainly educational actors (students, teachers, developers, librarians etc.). They appear in the members section of the group (Figure 9.2.2). For each member, the total number of contributions in the group is listed. The *Network* option shows a graphical representation for the group.

There were almost 1100 messages written in the group, approximately 100 being sent after the end of the course. On average, each member wrote 25 messages, which demonstrates an interested participation, and involvement.

The *Tagcloud* group section (present for any microblog too) allows interesting observations regarding the terms that appear most often in messages, the most active users, and the resources specified most frequently in messages.
In Figure 9.2.3 one can see the 50 words that have appeared most often in the last 500 messages.

Topics *Tagcloud* and *Network* are interesting features of the groups created on the Cirip.eu platform, useful in analysing the interactions in learning or practice communities. To evaluate the participants we have considered:

- number and quality of messages sent in course group
- the eportfolio which consists of public and private messages
- number of followers/followings/groups/feeds
- number of messages sent to other participants, reactions to messages
- direct communication with other participants and with other users of the platform.

The timeline, network, tagcloud sections of microblogs and groups offer useful data for evaluation.

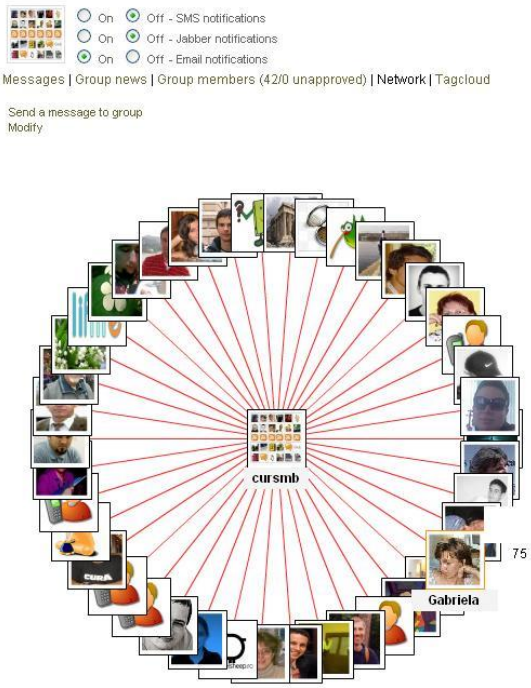


Figure 9.2.2. Group Members section (42 members)

Figure 9.2.3. Group Tagcloud

9.2.3. Collaborative Activities

In this section we offer an overview of the collaborative activities carried out during the course, which involved the use of other Web2.0 technologies. For most of the participants this was the first contact with them, so in advance helpful information was offered:

- *Puzzle images/digital storytelling* - we proposed a combination word - picture (Creative Commons from flickr) to be associated with microblogs and / or microblogging. Towards the end of the course this exercise was redone, to see if the opinion about microblogging was changed during the course.
- *A collaborative collection on delicious.com* created during the course, which was enlarged and used after the course end.
- *Translation of "Twitter in Plain English" video*, which is part of the *Common Craft Show* collection. Video is posted on dotsub.com, where the transcript was translated through collaborative editing a document on writeboard.com.
- *A voicethread object* with text and audio comments submitted by members.
- *Notes on a Flickr image*. Starting from wordle.net, a resource suggested by a participant - TBD, a tagcloud (Figure 9.2.4) with the words that appeared most frequently in the aprox. first 600 messages of the course was generated. One can observe: the most active members, nouns, verbs, and notions that appeared most often in discussions, participation and also a warm and open atmosphere between participants.
- A code of good practice on microblogs with items written by the participants using the collaborative platform writeboard.com.

Figure 9.2.4. Tagcloud created with Wordle, http://www.flickr.com/photos/cami13/2573662470/

Furthermore, we recommend that those who design teaching-learning scenarios to take into account issues such as:

- *What is the most important thing students should learn* about Social Media and *why?*
- *How do we achieve this?* The ability to employ the didactic methodology

and means in order to convey knowledge, skills and new abilities is translated into the teacher's capacity to be a good *organizer* of the setting of activities, to bring *experience* to the forefront.

- *What are students' expectations?* The teacher must respond to the students' need for information, must guide, counsel and assess them; must show outstanding flexibility in thinking and bonding with others; must have the skills and the availability to communicate; must have a good command of scientific content; must express a strong interest in obtaining efficient results etc.
- *How much time do we need to spend on Social Media sites?*
- *What are the students' interests?* Some students become hesitant when it comes to technical details, and they can instantaneously become alienated from the subject studied.
- *Is there an interdisciplinary approach?* A correlation with other disciplines such as: management, sociology, psychology, journalism, advertising etc.?

The topics selected should be interesting, familiar, exciting, and useful in the professional and personal life. Start from topics that the students probably have some experience with, such as relationships developed in virtual communities (as they are familiar with Facebook and Twitter) or the risks entailed by computerization. In order to summarize and integrate what students have learned, there is a need for *an adequate selection of teaching materials*:

- *The course notes*, designed to serve as the primary material, have the purposes of clarifying the disagreements on certain issues, of making complex ideas accessible in a coherent and concise presentation supported by definitions of key terms, by examples organized gradually according to complexity, and by specific exercises. But they have their limitations, such as the format in which they are prepared. This is why, during the last few years, we have chosen to develop courses using alternative C/LMS (Content / Learning Management System) systems, such as Google Sites, blogging platforms (WordPress, Blogger, EduBlog), microblogging (Twitter, Edmodo, Twiducate or Cirip), networking sites (Ning), wikis (Wikispaces) and even social networks like Facebook (Figure 3.1).

  How should we choose the most suitable teaching-learning media? For us, the efficiency of media depended mostly on their suitability to concrete learning situations. When we design a didactic activity, we usually ask ourselves what the most suitable media would be. With the emergence of new Web 2.0 technologies, the decision regarding the choice of media was influenced by:
  - the main events during the past years in the field of digital media used by students (such as the presence and use of social networks like Facebook, blogs and microblogs – Twitter, collaborative wiki-type sites or video sharing platforms such as YouTube);
  - the content of learning (the volume of information, the degree of abstractness, the interaction and the collaborative (re)construction of educational content);
  - the specific characteristics of the group of students (their number, previous experience, their expectations or interests, etc.);
  - the available material resources (equipment, space, materials);
  - the time available;
  - the potential of the teaching staff to use certain media.

- *Books on specific topics* can form the backbone of the bibliographic material or can be used in order to supply additional elements for various key themes of the course. Although there are opinions in favour of the idea that the digital student does not read and resorts only to Google and Wikipedia, some studies prove the contrary (Prensky, 2001; Head and Eisenberg, 2009). Starting from this premise and from personal experience as well, we have chosen to employ not only traditional course reading lists, but digital content (such as the one developed by Google Books or Lulu.com) and social publishing networks (Scribd, Calameo, Issuu etc.) as well. None of the books written on social issues in the digital age can be followed in a step-by-step fashion, like a traditional textbook. Instead, one must select certain passages that rise to the students' level, that provide challenges or, rather, represent a mix of the two.

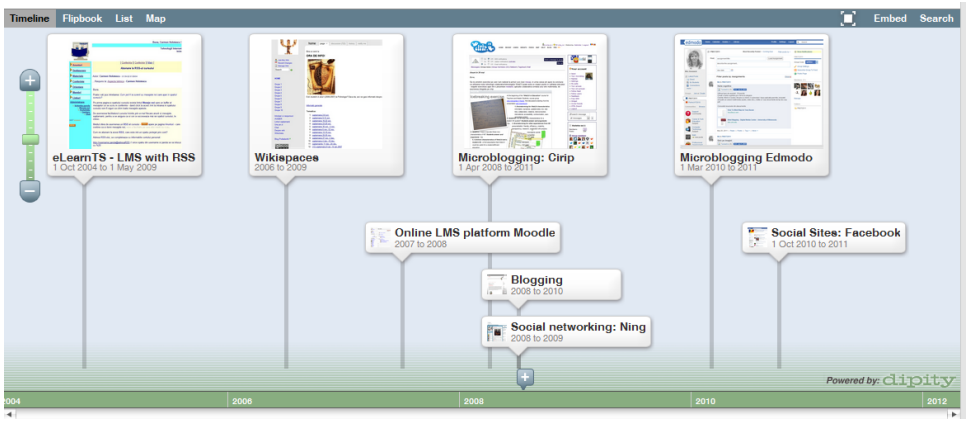
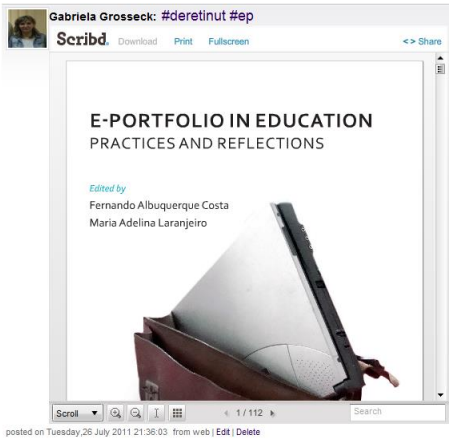
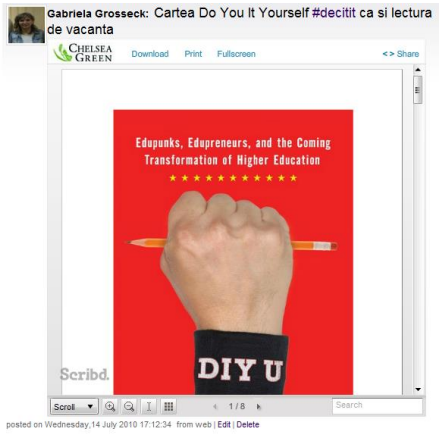


Figure 9.2.5. Timeline of different teaching platforms for academic courses, http://www.dipity.com/ggrosseck/Web-2-0-platforms-for-teaching/?s=t



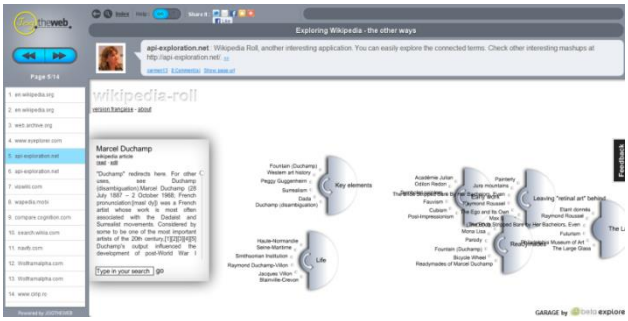
Scribd Books on microblogging platform cirip, http://www.cirip.ro/status/8213005



Lulu Content on microblogging, http://www.cirip.ro/status/3177928

Figure 9.2.6. Social publishing sites like Scribd (left) or Lulu (right) used in academic courses

- *Articles in (open) academic journals* provide explanations of research methods, present case studies or theories from scientific perspectives (Head and Eisenberg, 2009), can create contexts relevant to student dialogue, discussion or inquiry or can be used as starting points for deeper analysis. The drawback is that most students have not been educated to understand them, but they serve the important purpose of showing students that the themes discussed in our lectures are the focus of serious and thoroughly-prepared research. On the other hand, we use articles in prestigious journal databases, which can be accessed on the premises of the university, or employ academic reference management software like Mendeley, Connotea, Zotero, CiteULike etc., because books take a long time to be published and a topic as dynamic as Social Media cannot wait long for new editions. At the same time, we encourage students to search for and within such publications and include them in the course platform in the materials section.



The curation tool JogTheWeb allows teachers to accumulate resources on a particular topic, http://www.jogtheweb.com/play/E7IqqUfxaPu3/exploring-wikipedia--the-other-ways#1

Lecture capture change the course dynamics and improve students' learning, http://www.screenr.com/4Ml

Figure 9.2.7. Examples of media information

- *Media information* is an accessible source, at the crossroads between the students' life experience and academic path. Students can easily find course-related materials not only in newspapers, popular magazines, specialized press, even on the television and the radio, but especially in blogs, microblogs and social networks (one example are the TED conferences, which are available online; furthermore the presence of mobile devices is the synonym of a digital native life). The purpose behind using these sources is that of contrasting their image of computerization, which is often excessive and oriented towards sales or entertainment (games, music and particularly movies) with the careful analyses in academic journals.
- *Social Media projects* can be used as part of curriculum in a variety of situations by individuals or small teams of students: as an interesting way to begin the year, as a starting place for a collaborative project or just to connect with students and teachers in other universities.

As the learning process is continuous the training programmes must exist, and both students and teachers should take part in them.

We must not forget the fact that the students' results are also the teachers' results. New teaching techniques based on the technological evolution must be adopted: from redefining learning environments to cloud computing, mobile learning (fast access to knowledge, new and dynamic learning possibilities available anytime and anywhere), personal computers, multiplayer or online games are an important part of young people's lives and provide them with an opportunity to increase their social interaction and civic participation.

Ideally, we should try to explore a number of different methodologies, but every alternative will have its own advantages and disadvantages, both from an economic and pedagogical point of view. We have opted for:

- *Learning from events***.** The classical „conferencing" is still the most commonly-used method in most higher education institutions and it is potentially beneficial, as it is associated with the social interaction between students and between lecturers and students. Events become not only a way of educating, but also one of socialising, thus completing a coherent and mature strategy for communicating ideas, concepts, etc. Thus, during the last few years, we have experimented with the (voluntary) recording of students in open-source type lectures or events / learning from the microblogging stream (see Grosseck and Holotescu, 2010).
- *Collaborative learning by-doing***.** Already used in higher education „within different forms of cooperative learning arrangements" (Schaffert and Ebner, 2010), *cooperative learning with social software* is now benefitting from major applications as a method that is more effective and efficient than traditional forms of training. This methodology is used when students are intended to work together in small groups for significant stages of their learning process. There is an abundant specialized literature centred on collaborative learning of the 2.0 type, and for this reason we will not insist upon theoretical matters.
- *Peer-learning / Peer-mentoring***.** Activities based on individual work – research notebooks, projects – essays (with peer-review), reviewing specialized literature can also actively engage the students in the lectures based on the social issues of computerization.

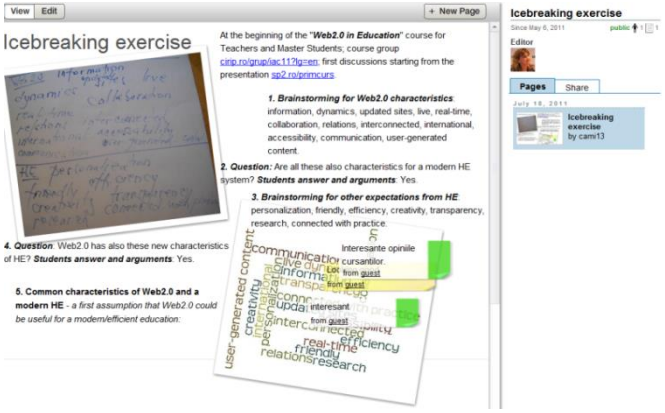


Figure 9.2.8. Example of collaborative exercise to define a concept / a term (NotaLand tool on MB), http://notaland.com/cami13/70859

- *Show me***.** Final projects require contact with the teacher and the teacher's support. Several types of projects can be set:
  - *Individual projects:* the theme discussed can be the same for all students or students can choose their own topic from a list suggested at the beginning of the course. Students value things that they themselves manage to do well, the things they solve and bring to fruition through their influence and ingenuity (they learn by doing and experimenting).
  - *Team projects*: in this case, there can be situations in which only one student does the work but the project is presented as being a collaborative effort, although tasks are allocated separately to each member of the group (Google docs, Voicethread etc.).
  - *Continuous projects*, which are developed systematically over an entire semester, or *final projects*, which are presented at the end of the course and thus account for a large amount of the student's participation in the course.
    Students can employ all types of audio and visual materials - but they most often opt for creating PLE / PLN, e-portfolios or digital storytelling and mindmapping applications - for which they subsequently obtain feedback via poll or quiz-type applications, using mobile devices in particular. We personally prefer not to grade the student's technical skills; we do however require that the presentation of the results be as professional as possible. We favour continuous projects because they enable us to permanently monitor the students' work and make it possible for us to intervene at any point in order to provide observations or recommendations. Students are motivated and love to work on projects related to topics they are interested in, but, if they are not periodically checked on, they often postpone writing the projects until the very last moment.

- *Step by step***.** Seminars during which each student presents a usually challenging or controversial topic. The students are given several weeks in which to prepare the argumentations they will present in front of their colleagues, and the teacher is permanently guiding them by assuming the role of a facilitator, thus establishing a „from-person-to-person" relationship with each course attendant. For the „debate academy" we prefer using communication / collaboration methods that are specific to Web 2.0 (instead of the classical YM chat), and we start from simple instruments such as wiffiti or Google Moderator.

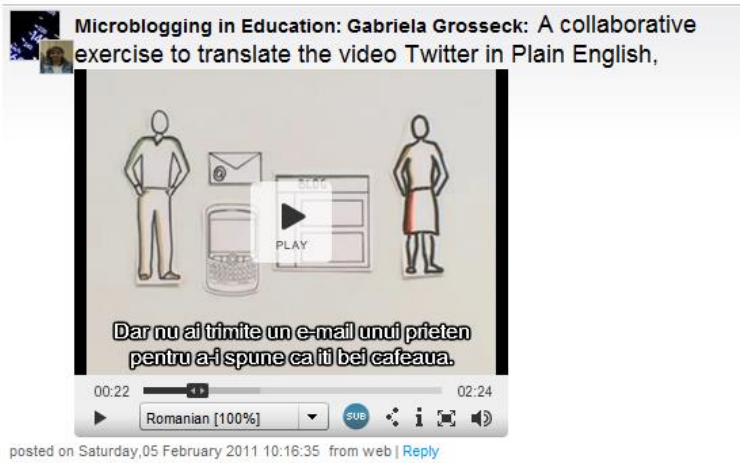


Figure 9.2.9. Examples of team projects exercise to translate a videoclip (using GoogleDocs), http://www.cirip.ro/status/4614450

- *Life Story hunter / life experiences.* Students can learn best about Social Media from their personal experience, as well the experiences of others. We start by telling students about our own personal experiences and encourage them to do the same (using podcasting, for instance). Students become aware of the way in which computerization affects their own lives, as well as the lives of the people around them.

Irrespective of the method employed, the method that is most suited to a Social Media based learning process will be the one that meets the students' expectations.

9.2.4. Remarks about the Learning Community

For a successful learning community that preserves the motivation and interest of its members, the facilitator plans thoroughly, provides enthusiasm, gives the same attention, feedback, encouragement to all. You clarify or learn new things sharing with the others, you feel that your opinions are important.
When facilitating an online course on a microblogging platform:

- The teacher should show a positive, open and responsive attitude to the changes brought by microblogging in education
- The teacher should be able to adapt the initial curriculum, in particular to follow some „fruitful" students' suggestions
- Students should be encouraged to adopt methods of mutual consultation (including Direct Messages or using @user_name), especially in group projects
- Ensuring quality teaching of using microblogging depends on teachers' professional profile.
- Teachers should moderate the participation of students in group communication.

The course promoted values and attitudes among participants, and an ambient awareness for „communication, connections, and immediacy in 140

characters at a time" (Milstein and Lorica, 2008) seldom seen in other online learning situations:

- interest in life-long learning; motivations and flexibility in developing their own educational and vocational route
- respect and confidence in themselves and others
- facilitate mutual awareness; responsiveness to the emotions of others
- valuing interpersonal relations - to learn how to take turns in speaking
- the course turned into an interface to own experiences - developing the skills to meet the demands of social life in general
- analysis of real needs and problems (examples: How do I ...? Does anyone know if ..? etc.) and building polls (which are Ciriposphere verbs - the metaphors of microblogging).

During the course the participants developed the public part of their microblogs: writing public messages, following and discussing with other users, validating the topics of the course, monitoring feeds, and being part in other groups. After the course ended, they continue to activate on the platform, communicating and collaborating with facilitators and other participants. This is an important advantage of this platform, the learning community continues to be active after the course ended.

The course has also allowed:

- a wide variety of expression forms (voice, video, images etc.) using mashup tools already tested in education, for communicating personal and didactical experience; we could note that the participants contributed with audio/video messages only after the learning community was consolidated
- the application of effective and flexible techniques in using microblogging in education
- reversibility of messages
- to build a set of best practices
- promoting personal blogs
- export microblogs notes on the blogs
- "ambassadors" of ideas / concepts / events
- humor, good mood.

There were also:

- moments of inertia (see group timeline for messages distribution in time)
- certain technical constraints (do not forget that it is a platform in continuous development and improvement), messages without dissipation
- unequal contributions from participants
- a certain degree of pollution or noise information.

For us microblogging, and especially Cirip.eu, proved to be an effective tool for professional development and for collaboration with students, that can change the rules of the courses and models good pedagogy responsive to student's learning needs. Furthermore, as a social networking / microblogging platform, Cirip.eu provides valuable interactions in educational context, acting as a social factor in a course management system (Katz, 2008).

We appreciate that the microblogging platform Cirip.eu has facilities which permit to deliver successful and quality online courses; the communication, authoring, monitoring, statistical facilities make Cirip.eu a modern free LMS; it integrates many web2.0 technologies, and also allows participants to develop their PLEs/PLNs.

To facilitate an entire online course or a part of a course on such a platform requires specific facilitation skills, and collaborative technologies knowledge. The effort and time needed are more important than those for an online course hosted on a classic LMS.

9.2.5. Aspects related to course facilitation

According to R. Gagne's Nine Events of Instruction, proper teaching sequences should be followed in order to achieve the learning objectives. Table 9.2.1 contains a model with micro-based training events used in the courses facilitated on Cirip, and concrete examples of activities corresponding to each event of instruction and digital strategy can be found by those interested in a spicynodes mindmap (Figure 9.2.5).

Table 9.2.1. Anatomy of a microblogging course

Event of instruction	Digital strategy
Gain attention	It is essential to raise students' interest and curiosity from the beginning. This can be achieved through audio, video, news, animations, questions etc. that will help us understand how students express their (learning) needs (Efron and Winget, 2010).
Inform learners of objectives, expectations	Students should be informed about the objectives, expectations, activities, about what they will learn and how to get involved in the *Announcements and Materials* section, by using multimedia content.
Stimulate recall of prior learning	Before starting the course, students are required to complete an assessment of their knowledge (questions or an activity to engage existing knowledge). At the end of the course they are asked the same assessment again, which shall be compared with the one at the beginning.
Present stimulus material	Interactive materials with a variety of (social/Web 2.0) media.
Provide learning guidance	Elaborate on presented content by telling (collaborative) digital stories (in 140 characters), explaining examples and non-examples, offering analogies (Gable, 2010)
Elicit performance (practice students' skills and knowledge)	Obtaining performance is an important step. The teacher must find questions based on course objectives and present them as interactive exercises. Asking questions is an important strategy for generating social interaction via microblogs (Efron and Winget, 2010).
Provide feedback	Students should be given the correct answers and, if possible, a brief explanation to help them shape their behavior to order to improve performance.
Assess performance (test students)	Results can be identified in the profile/e-portfolio of students who develop such initiatives, become self-motivated, flexible, innovative, and realistic, who perform tasks and solve problems, accept the complexity of life, respect the diversity of perspectives and viewpoints, and cultivate self-control and desire for lifelong learning.

Enhance retention and transfer	Learning content management in university for various programs of study. It provides the means to create and re-use e-content and reduce duplicate development efforts.

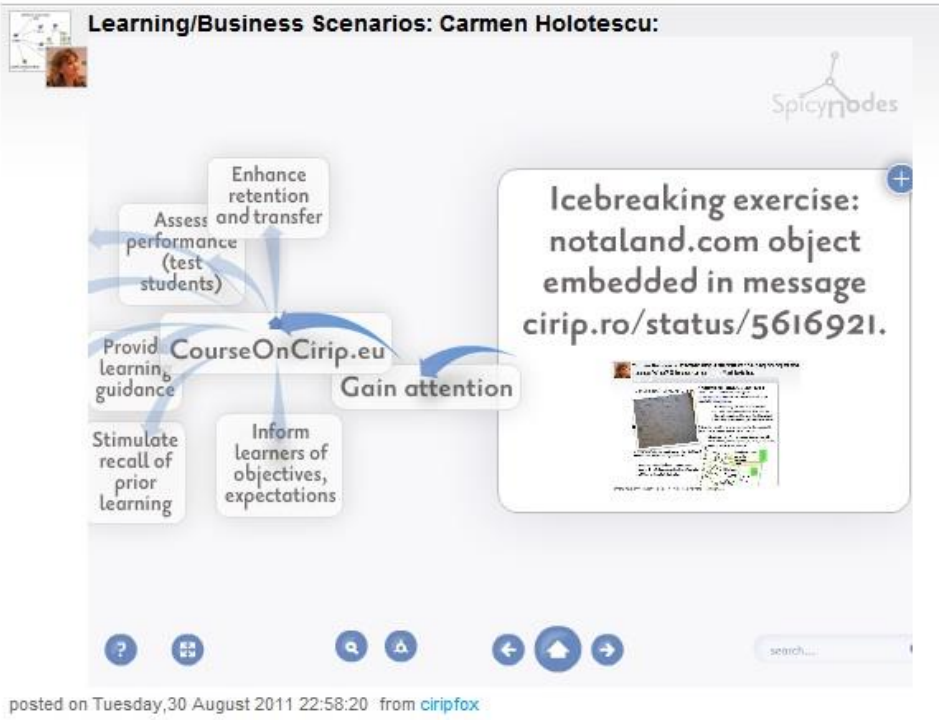


Figure 9.2.10. Anatomy of a microblogging course as a mindmap, source cirip.ro/status/9312507

What we have noticed is that the prevailing learning style was the practical one, through active experiment (learning by doing style). The fact that learning units were created through Web2.0 technologies and subsequently encapsulated as multimedia objects both in *Announcements* and as messages posted in the group, the major advantage being that experience was gained through participative methods and practical validations, students themselves testing the new technologies presented.

Cirip acts both as a microblogging platform and a social network, that engages participatory experiences, collective learning, transforms the traditional / blended course learning space in a dynamic, user-centered environment. The student is seen as a participant in the act of learning in a framework with a social structure. For instance, participation in collaborative activities and interactions with other members of the platform are factors that help learning, which becomes a product of participation and collaboration. Figure 9.2.11 illustrates a synoptic vision of the various elements used to assist the learning process of the educable in the social environment of Cirip.

By the end of the course students should know and use social media features in one context or another. We particularly hope that by the end of a course

held on a microblogging platform ubiquity of tools, services, Web2.0 applications will have a profound impact on lifelong learning, allowing for the establishment of true learning networks and the construction of social PLN. These are networks of people and organizations that create, support and use learning resources.

We see this study as a possible solution for developing integrated educational systems based on microblogging, covering both components, learning and evaluation, as an alternative to the institutionally hosted and supported virtual learning environments, having a user generated, activity focus that supports teaching and learning in educational settings. However, we aim at dealing with the various issues raised during the teaching-learning-evaluation process, as follows:

- A preliminary initiation of students is required (and sometimes of the teachers who have to co-ordinate the platform) – some don't know or fail to implement this technology correctly, while others won't adapt to the new requirements (responsibilization of the teachers).
- Eliminate the effects of incertitude, as in the case of any innovation or change. One of the difficulties is the hierarchisation of knowledge (the difficulty finding and choosing the relevant resources to post, to turn information into knowledge).
- Develop a student-centered qualitative model (quality characteristics, measurement indicators, evaluation criteria).
- Elaborate recommendations for applying this technology in higher education environments.

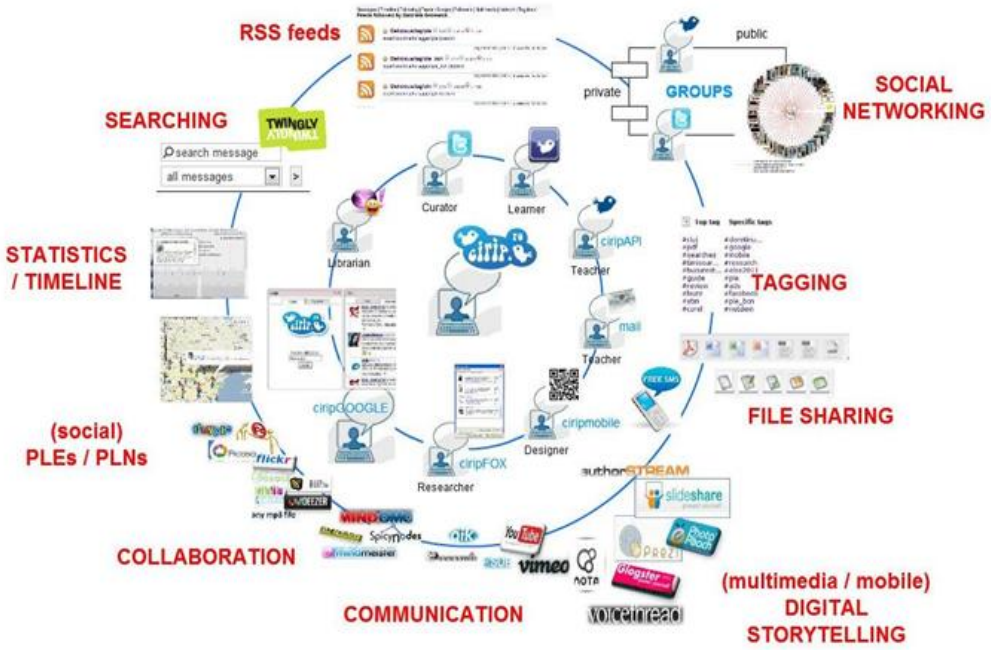


Figure 9.2.11. Elements of constructing social learning environments on Cirip

9.3. Learning from the Stream

Even at first glance there seems to be only a linguistic connection between microblogging and m(y)-conference/m(y)-event, the recent literature registered an upward curve in the number of papers that analyse the usage of microblogging as a community event tool. While the vast majority of studies are investigating the use of the most popular microblogging application Twitter for group communication, the impact on group participants, quantitative analysis of message types, and motivational aspects, there are few research and case studies that address the use of microblogging for learning from informal conversational flow (learning from the stream). In this context, this study aims to examine: "How the micro-connection to a specific event can enhance the learning experience of students enrolled in formal university courses?"

9.3.1. Microblogging as a backchannel solution

Even at a first glance there seems to be only a linguistic connection between microblogging and conferences / events, the recent literature registered an increased number of papers that analyse the *usage of microblogging as a community event tool.* The usage may fall in one of the following categories:

- *information interfaces* (Sutton, 2010; Kwak et al, 2010; Mendoza et al, 2010)
- *communication* before, during and after the event (Balcom, 2007; Reinhardt et al, 2009; Ebner and Reinhardt, 2009; Ebner et al, 2010) between participants, organizers, presenters and audience
- *monitoring the event* for non-participants (reporting / online coverage the event) (Ebner et al, 2010; Saunders et al, 2009)
- *presentation* (Mitchell, 2009)
- *collaborative keynotes* (Hart, 2010)
- *participation / engaging audience* (Atkinson, 2009; Harry et al, 2009)
- *live-blogging session / instant discussions* (Ebner and Reinhardt, 2009)
- *live annotations of a broadcast media event* (Shamma et al, 2009)
- *official / quasi-official / unofficial back-channel* (Ebner and Reinhardt, 2009)
- *persistent / mobile / mobilizing backchannel* (McNely, 2009)
- *messages transcription / twitter subtitling* (Du et al, 2010)
- *back-chatting* (Yardi, 2006/2008; Osmond, 2009), and even
- *for evaluation* (Ebner et al., 2010; Shamma et al, 2010),

and may also belong to a variety of settings: professional, academical / educational, scientifical, or for specific organisational purposes (McNely, 2009; Letierce et al, 2010).

These events use different digital / social media technologies / applications / platforms and several formats (e.g., (un) keynotes, multi / poster sessions, workshops, roundtable discussions, social events, etc.). Usually the participants use *hashtags* for the events / topics findability across different social platforms.

While the vast majority of studies are investigating the use of Twitter for group communication, the impact on group participants, quantitative analysis of message types, and motivational aspects, there are few research and case studies that address the use of microblogging for learning from informal conversational flow. In this context, this study aims to examine: "How the micro-connection to a specific event can enhance the learning experience of students enrolled in formal university courses?" We will answer this question by exploring the integration of the "PLE Conference 2010" information flow into the microblogging platform cirip.eu.

9.3.2. Framework

In the 2nd semester of the academic year 2009-2010, the two facilitators have run the following courses in private groups: "Computer Assisted Instruction" with freshmen of the Pedagogy Department of West University of Timisoara, respectively "Multimedia" with college juniors of University "Ioan Slavici" and "New Educational Technologies", a continuous training course for teachers at University Politehnica Timisoara.

Social Learning and Personal Learning Environments (PLE) were common topics of the three courses curriculum, and related materials were presented in the courses groups. Also, six students, divided in two working teams, taking part in the "Multimedia" course, had to develop collaborative projects related to PLE.

During the semester the first PLE Conference was planned out, and eventually took place in Barcelona during the month of July. The facilitators decided to use in their courses, for documentation and research the conference-related content and informal interactions on different social networks.

Figure 9.3.1. The first message in the PLE group, source: http://cirip.ro/status/2180463

On January 8th, 2010, when the first call of papers for the PLE Conference (http://pleconference.citilab.eu) was launched, the *PLE / PLE Conference in Barcelona* group was open on Cirip.eu (Figure 9.3.1), at http://cirip.ro/grup/plebcn and will remain active until the last echo of this event will fade away.
The members of this group are students, and also teachers, practitioners in education, trainers, and other persons interested in the PLE domain (Figure 9.3.2).
The aims of the group were:

- to be a source of *real-time information, connections* with practitioners worldwide
- to constitute *a framework for learning / communication / sharing in the PLE domain* for the students in our courses, but also for other members interested in this domain
- to offer an environment for *strengthening knowledge in this domain* and *new PLE related experiments*
- to offer access to all the group content, visualizations and statistics for *future reflections and studies.*

9.3.3. Content for student activities

The group messages consist of:

- *tweets* referring to the PLE Conference, imported using the Twitter search API (the searched terms are PLE_BCN OR "PLE Barcelona" OR "PLE Conference" OR pleconference.citilab.eu),
- *blogs posts* which mention the conference, found using the Twingly search engine API, by searching "PLE Conference Barcelona"
- *multimedia notes* sent by the cirip members who joined this group (Figure 9.3.4).

This way the group is a *backchannel* of the PLE Conference and its messages reflect the interaction/debate on cirip.eu and in a worldwide community concerning PLE and conference.
The actual number of messages on twitter and blogs could be higher than the ones imported, the difference could be explained by Twitter and Twingly APIs limitations, but also by the specificated search terms.

Figure 9.3.2. Group statistics and Feeds related to PLE

The content of the group and its information flow on PLE were enlarged with:

- *specific requirements* for students' activities and *materials* related to PLE posted by the facilitators in the group Announcements section;
- *feeds/search feeds* on PLE topic monitored by the group members using the platform corresponding facility; they are delicious.com feeds with ple, pln, ple_bcn tags, also the feed corresponding to the collection built by the group members, using the ple_cirip tag (Figure 9.3.2).

9.3.4. Students' activities

Students' activities related to documentation and collaborative projects were organized in five stages and were hosted online by the PLE group, and by the private spaces of the two working teams; a few activities were also discussed face-to-face (f2f) in the laboratories. In completing their tasks, the students used the advanced facilities of cirip.eu.

Because the semester ended prior to when the conference was held, participation in the PLE group during and after the conference was an optional activity, performed especially by students interested in the fields of PLE and social learning for diploma thesis. Thus, once again, it was proved on cirip.eu that learning communities continue their collaboration after the course ends.

Students' activities were grouped in five stages ((M) are specific activities for Multimedia course):

a. preliminary documentation – online and f2f

- preliminary documentation related to PLE and task understanding -

information published by the facilitators in the News section of the PLE group
- familiarisation with the PLE group, understanding the stream integration
- open private groups for the two working teams (M);

b. documentation and interactions in the PLE group - online
- follow group messages (online or by SMS), identify key experts, main discussion topics, types of messages and resources - for these activities the group sections Messages, Members, TagCloud, but also statistics and search facilities came in useful (Figure 9.3.3)
- commenting interesting posts and resources
- send (multimedia) messaging containing new resources
- interact with colleagues, facilitators, other group members
- track specific feeds described above - online or by SMS
- participate in a survey related to possible definitions of PLE (M) - online or SMS reply
- each team has closely followed two key actors, identifying their work, entering virtually in their "research laboratories" (M);

c. collaborative work – online and f2f (M)
- comment a video related to PLE by sending messages in the two teams' groups; the messages were exported as a .srt file by the specific facility of cirip.eu, and used to subtitle the video published on dotsub.com
- final projects published as collaborative Google docs, embedded in messages; the projects evaluated a few multimedia resources, and the work of the followed experts;

d. activities evaluation – online and f2f
- conclusions related to the value of the PLE resources discovered
- discussions on how students' own PLEs were developed and enlarged during the interaction with the stream;

e. optional activities - online
- interactions and documentation during and after the conference.

Figure 9.3.3. Group Tagcloud and search facility

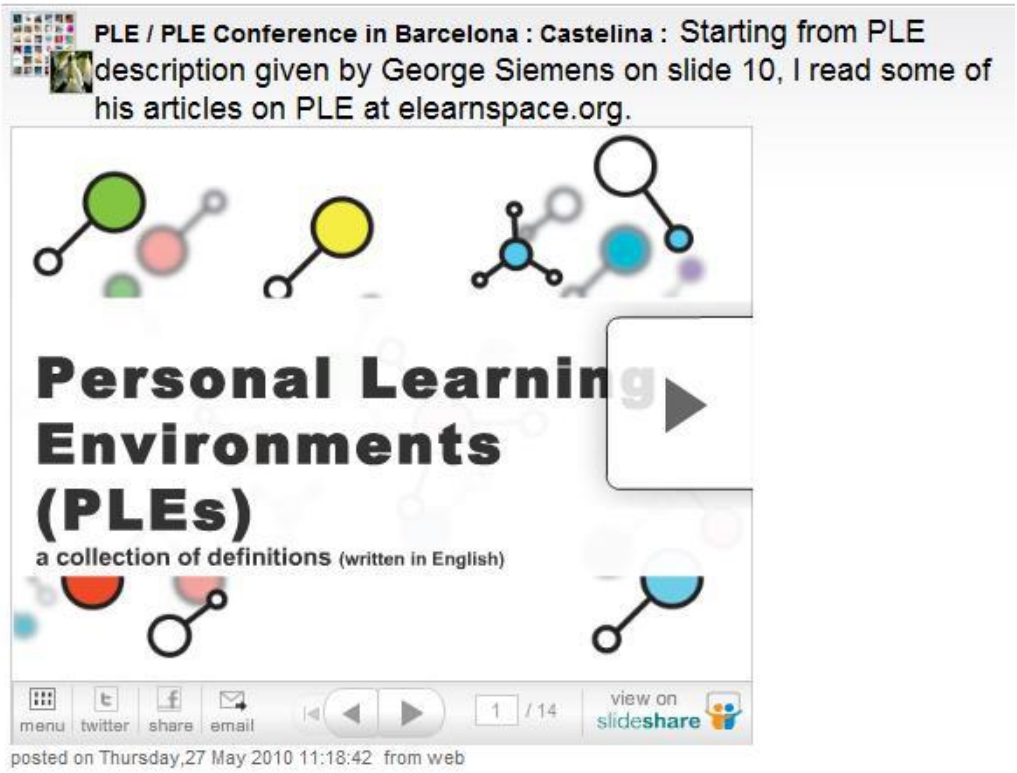


Figure 9.3.4. Message sent by a student, embedding a slideshare presentation

By using the cirip.eu platform, we proposed and facilitated a new and challenging form of social learning, a new dimension of openness: *learning from the stream*, integrating a conference stream conference in higher education courses. The aim of our study was to make a preliminary evaluation, our findings can only lay the foundation for the elaboration of further and more thorough research. However, our explorative study leaded to several positive results.

Students taking part in different courses from three different universities have interacted with the stream, having common activities; thus this experiment is an affirmative answer to the question "their tweets can reach other communities, in addition to their own?" (Letierce et al, 2009).

Stream integration in the PLE group allowed an uniform interaction, with the same communication mechanisms used by the students in the course group. Continuous facilitation and communication with our students were needed because we could not estimate a priori the development of the ongoing stream volume, dynamics, and content.

Our students appreciated that learning from the stream proved to be a novel and efficient method for documentation and research on PLE, meaning an openness to real-time and valuable content, resources, and also an opportunity to follow experts and practitioners, being an illustration of open and social learning.

The *scenario* of learning from the stream was presented as a *mindmap* in the learning design group (Holotescu and Grosseck, 2010); the discussions with

teachers, students, practitioners revealed other educational contexts in which such stream integration can be achieved, but also alternative and additional applications that can be used for integration.

The archived content and interactions, statistical data, and visualisations, limited here by the paper length, can be accessed at http://cirip.ro/grup/plebcn, and used in future courses, documentation, and studies. Therefore, the group can be considered not only a *time capsule* of the worldwide practitioners' interaction concerning PLE and the PLE Conference, but also a *learning experience*, important in PLE documentation. Moreover, we can speak about a *learning serendipity*, which may provide substance for further research projects.

9.4. Integrating MOOCs in Blended Courses

9.4.1. Blended Learning and MOOCs

Recent studies appreciate that MOOCs "bring an impetus of reform, research and innovation to the Academy" (Hagard, 2013) and that the phenomena of MOOCs is part of the wider context of open education, online learning, globalisation of education and constrained budgets (Yuan and Powell, 2013). Even though MOOCs are usually developed and delivered as independent online courses, experiments to wrap formal university courses around existing MOOCs are reported by teachers and researchers in different articles (Bruff et al. 2013; Bruff, 2012; Caufield et al., 2013; Koller, 2012). MOOCs offer teachers, researchers and practitioners the opportunity to experiment, to study different possibilities for using their elements in campus settings as a form of flipped classroom or blended learning approach (Hill, 2012).

Anant Agarwal, president of edX, considers that the blended learning model can be achieved by mixing the MOOC technology with traditional/in-person class, this way transforming, democratizing and improving education. Taking MOOCs in the large and applying them in the small can create a blended model of education to really reinvent and reimagine what we do in the classroom (Agarwal, 2013). He appreciates that in the summer of 2013, around 100 blended courses that were running around the world were hosted on the edX platform (Walters, 2014), leading to their labelling as "the next-generation textbooks" (Agarwal, 2013) or "super-textbooks" (Bruff, 2012).

On the other hand, Daphne Koller, one of the Coursera founders, was an early Stanford promoter of the flipped classroom paradigm that mixes video-based instruction and automated assessment, accessible in a MOOC space and assuring self-pace learning and interaction with the material, with interactive face-to-face activities: teacher support for deeper understanding of the topics, group projects and problem based learning (Koller, 2012).

MOOCs can also be seen as pools, resources for "distributed flip", a term coined by Caufield and Collier, meaning that content curation, sequencing and community are distributed (Caufield, 2013a). Noticing that technology allows us to move more activities out of the classroom than it was possible previously, Caufield (2013b) speaks about the distributed flip, as a way of approaching flipped classroom design, in which „some amount of design of flip materials is done centrally by a group of people, either as a company, consortium, or loose network of individuals". Then the resulted high quality materials will be used by distributed facilitators / teachers, who will personalize them by considering the particularities of their flipped classrooms. In most cases teachers use parts of MOOCs in their courses just as

collections of digital resources, not synchronizing their students' activities with the cohort activities in the central MOOC (discussions, assignments), so the social features of MOOC are not used.

In Table 9.4.1 we propose a systematic view of different possibilities for blending MOOC in courses, one dimension being the synchronicity between the MOOC and the course, and the other the portion / numbers of MOOC to be integrated.

Table 9.4.1. Variants of blending MOOCs in university courses

		MOOC(s) integrated in the blended course		
		Part of a MOOC	An entire MOOC	Multiple MOOCs
Synchronization between the blended course and MOOC(s)	No synchronization	The content (some modules) of a number of MOOCs are used just as (additional) digital resources. Students study the MOOCs' content, but the assignments, discussions and evaluations are parts of the blended course.		
	Synchronization	In the MOOCs' space, students study the materials and also participate effectively in social activities: assignment solving, forum discussions, peer-assessment; class teacher supports them with feedback, additional materials and resources, evaluation; communication also with the local learning community for deepening the topics and group projects.		

Of course the most complex (and efficient) blended courses are those corresponding to the synchronization perspective, in which students study (part of) the content of a number of MOOCs and also participate in their social activities (assignments, discussions, peer evaluation), the task of the teacher being to synchronize the activities of his or her own course with those of (multiple) MOOCs, proving support, feedback, additional resources, moderating and nurturing the local learning community.

For freshmen and students who have not yet developed self-study skills maybe more support from class teacher and colleagues is needed, so the unsynchronized approach could be more suitable.

9.4.2. Methodology

This case study describes a new approach, in which the participation of students in different MOOCs was integrated in a blended course run on Cirip.eu, in a dedicated private group (Figure 9.4.1).

The subjects of MOOCs delivered on specific hosting platforms and having particular characteristics were connected with the Fall 2013 undergraduate course of Web Programming, at University Politehnica Timisoara, we have facilitated.

The topics of this course consisted of a wide range of subjects, covering both the technical and social part of Web2.0:

- HTML/HTML5, Javascript, CSS, XML, Perl, PHP, MySQL, Ajax;

- Web2.0/Social Media (blogging, microblogging, social networks, collaborative applications, curation/collaborative bookmarking systems, RSS feeds, mash-ups), Open Educational Resources and Creative Commons licenses, Massive Open Online Courses.

The valuable face-to-face class time was devoted to discussions for a deeper understanding of the subjects, also for exercises and feedback on assignments.

The online space of the course was a private group of Cirip.eu, hosting the materials, resources and interactions (as multimedia notes) between teacher and students (http://cirip.ro/grup/progweb13). Students could access and study the materials, OERs and additional resources any time they needed them. Messages posted online, via mobile devices or by SMS in the group space assured a live interaction between peers and teacher, being the basis of the local learning community: to ask questions, to comment new resources, to submit the multimedia results of different assignments and projects.

During the course, each student could also build a Personal Learning Environment, monitoring different feeds, interacting with external users or practitioners, or being connected to other Social Media platforms which gather educational resources.

9.4.3. Research goals

During the first part of the term, the topic of Massive Open Online Courses (MOOC) was discussed, together with their challenges and benefits for education. By that moment students have already chosen the theme of the group project and they have split in working groups.

Counting towards 10% of the activity in the blended course they have to select a MOOC and to effectively participate in at least 10% of the massive course activities.

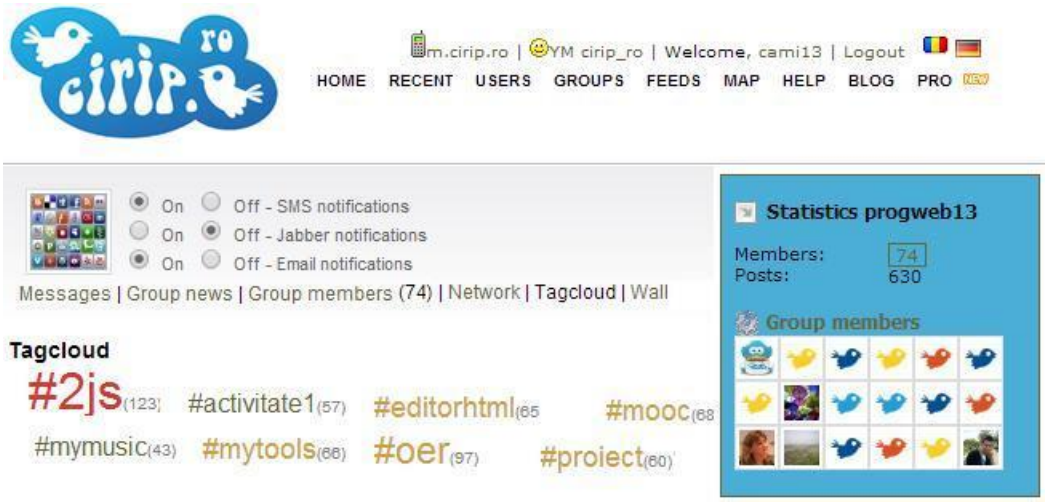


Figure 9.4.1. Course group on Cirip: members, number of messages and the tags used for activities

The aims of integrating MOOCs in this university course are listed below:

- Allow students to become familiar (aware) with the MOOC phenomenon and trends:
  - To learn about the most important players/platforms/offers, types of learning, interaction and specific pedagogies
  - To be able to search and evaluate useful and quality MOOCs;
- To enlarge knowledge/topics of the course, to obtain an auxiliary support for students' group project development;
- Allow students to have concrete views, opinions and proposals on MOOCs and to critically evaluate their usefulness for personal development and for different ways of integration in formal higher education courses.

9.4.4. Research methods

In order to achieve these aims, we followed the next steps for MOOCs integration:

1. MOOCs discovery and selection:

- In the first part of the course, in the materials section of the Cirip group, the course tutor has provided a material and resources presenting the Massive Open Online Courses phenomenon, as well as MOOC directories / platforms:
  - http://openeducationeuropa.eu
  - http://mooc-list.com
  - https://futurelearn.com
  - https://class-central.com.
- Students were invited:
  - To post a message with the tag #mooc containing the names and links of 1-2 MOOCs connected with the course topics, in which they would like to participate (mandatory activity);
  - To comment / provide new resources on MOOCs (optional activity).
- Students could discover new courses and find / comment on the opinions of their colleagues.
- Teacher's feedback in case the MOOCs proposed by the students were not connected with the course topics.
- A tagcloud with the names of the courses proposed, then followed by the students was published in the course space.

2. Participation in MOOCs:

- During the term, students took part in at least 10% of the activities of a MOOC (requirement).
- Messages with impressions resulted from participation were posted in the course space (optional).
- Moreover some of the students discussed or asked opinions on their concrete activities in MOOCs, receiving feedback from the local learning community (both colleagues and teacher).
- As part of the assessment, each student had to present to the teacher the portfolio of the activities carried out on the MOOC platform.

9.4.5. Summary of data evaluating MOOC participation

Before the Web Programming course ended, students took part in a survey evaluating their experiences related to the MOOCs. 55 of the 70 students enrolled in the course responded (78%).

Overall, it was a dense course with a high interaction, there were 630 (multimedia) messages sent in the course space, which means that each participant sent a number of 9 notes (Figure 9.4.1).

A summary of findings is presented in the following:

- Percentage of students who knew about the MOOCs phenomenon before this course: around half of the students (49%) (Figure 9.4.2.a).
- Followed at least a MOOC before the course: less than a third of the students (29%) (Figure 9.4.2.b).
- Will follow other MOOCs: 100%. All students plan to follow new MOOCs, thus recognizing the importance of enlarging their knowledge during formal education, but also of continuing education (Figure 9.4.2.c).
- Even if a participation in 10% of the MOOC activities was required, two thirds of the students (66%) have realized more than half of the assignments, while a quarter (24%) completed the whole massive course (Figure 9.4.2.d); the completion rate (24%) is much higher than the average value of 10% for most MOOCs, as reported by current studies (Haggard, 2013).
- Almost half of the students participated in MOOCs hosted by Coursera (44%), nearly a quarter on Udemy (23%), the rest have chosen Udacity, edX, Khan Academy, Codecademy, FutureLearn, but also European MOOCs found on the Open Education Europa portal.
- Most of the MOOCs were in English and a small number in French. However, several students have participated in the collaborative translation of materials in Romanian, where possible.
- Some of the students reported that they have followed a few MOOCs in parallel for supporting other disciplines of the Fall term (for a few courses, their activities in MOOCs were formally recognized by other teachers) or just for self/individual study.
- Suggestions for improvement of the Web Programming course: in general, students' opinions about the course were very positive, they appreciated the multimedia materials, high interactivity, collaborative activities, mobile access, openness to Social Media platforms, OERs and MOOCs; most proposals were for increasing the number of tutorials in video format.

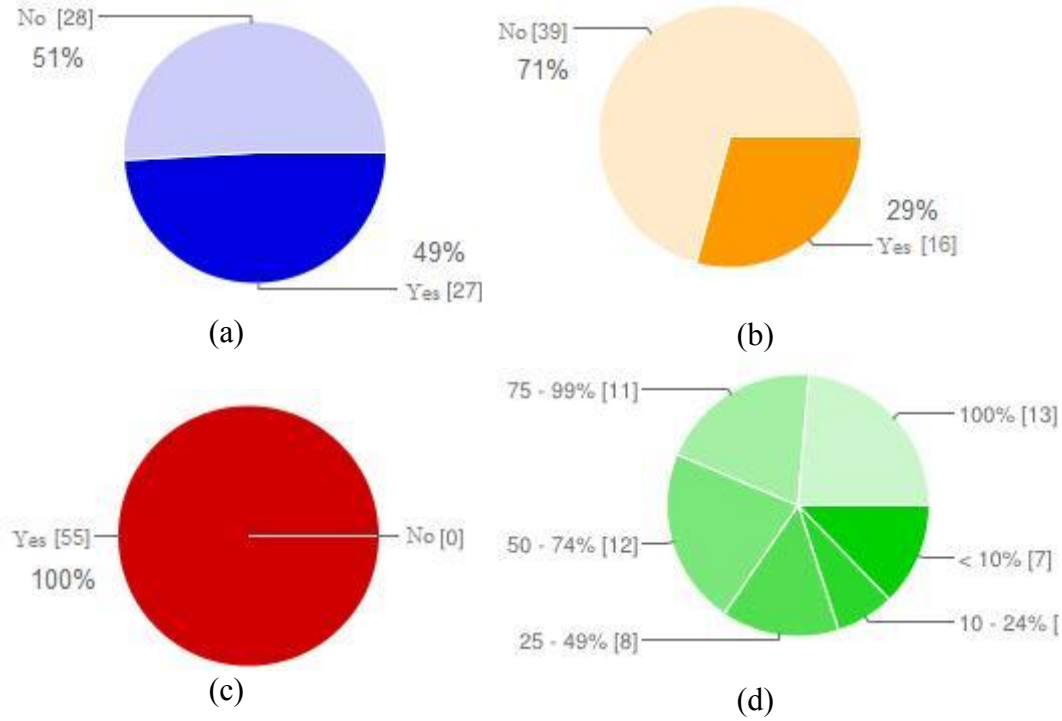


Figure 9.4.2. Distribution of students: who knew about MOOCs before the course (a), followed MOOCs before the course (b), will follow MOOCs after the course (c); Percentages of activities completed in MOOCs (d)

9.4.6. Discussions

In the open comments section of the survey asking for opinions about ways to improve the involvement / participation in MOOCs, some students reported the need for a direct communication and feedback from MOOC facilitators, not only from peers. This demonstrates the need for direct communication with facilitators for learning motivation and personalization. A solution is the interaction, both f2f and online, with the course tutor / local facilitator / teacher, as an important component of the blended model. Others suggested that the transcript or at least the abstract of each video material should be published (the same as for videos published on TED.com or dotsub.com). This feature would assure the possibility to search and to focus on specific topics presented in the video clips.

Before this blended course half of the students were not familiar with this new opportunity for education, while all students reported that they have decided to attend new MOOCs. So, the aim of integrating MOOCs in order to sensitize students to the MOOC movement was fully accomplished.

Table 9.4.2 summarizes the activities realized by students in the blended course and for each activity the pedagogical benefits are underlined (Agarwal, 2013; Burdett, 2003; Glance et al., 2013). The specific tags used to report the results of different activities as multimedia messages in the course group are also listed (Figure 9.4.1).

Table 9.4.2. Blended course activities and pedagogical benefits

	Activities in the blended course	Pedagogical benefits
Face-to-face activities	Discussions for deeper understanding of the course topics/requirements	Learner-centric teaching
	Feedback on assignments	
Online activities on Cirip group	Follow multimedia course materials posted in the group space	Self-paced study for different learning styles, enhanced focus and attention
	Discussions/evaluation of OER projects/initiatives and CC licenses (#oer)	Openness to/culture of knowledge-sharing and re-use, exploitation of the OER movement benefits, critical thinking
	Discussions/evaluation of free tools / collaborative platforms for learning (#mytools)	
	Post collaborative work results on SM platforms as littler OERs (#project)	
	Posting multimedia notes with comments, feedback, new resources for course topics	Collaboration in local learning community, peer assistance
	Post evaluation of additional resources, follow/interact with external users/practitioners, monitor RSS feeds	PLE building
Group work	Group project (#project)	Skills for collaborative work: challenge assumptions, delegate roles and responsibilities, share diverse perspectives, find effective peers to emulate, collaborative tools usage
MOOC	Study MOOC materials (short videos, podcasts, presentations) and answer to corresponding quizzes	Self-paced/active learning
	Solve assessments	Retrieval learning, gamification
	Evaluation of peer assignments	Peer-assessment, assuming objectivity and responsibility
	Discussions / feedback in MOOC forums	Participation in global learning communities, instant feedback
	MOOC selection (#mooc)	Skills for continuing and for learning autonomy, self-assessment of learning objectives

This case study is a new scenario proposal for open educational practices, bringing new perspectives for integrating MOOCs in blended courses/flipped classrooms. Students have had a high autonomy in assessing their own learning needs for choosing the MOOCs in which to participate in order to deepen the course topics, but also to find useful information for group project development.

The integration of MOOCs exposes students to high quality materials created with top educational technologies, to collaboration in global learning communities and to a broader range of experiences than those to which they otherwise might have access.

New skills and tasks are required for teachers facilitating blended courses integrating MOOCs: complex course design and management, OERs and MOOCs curation, evaluation of distributed and collaborative activities of students, facilitation of the local learning community and nurture of its integration in the global communities of MOOCs and many more. All of these could be accomplished only if teachers adopt a new and open attitude towards the teaching-learning process, have the will to test and to learn new things together with their students, wanting to oppose uniformity and self-sufficiency.

MOOCs offer challenging opportunities to teachers themselves for improving their knowledge in their own area of expertise and for improving their competencies and skills for adopting new models of open educational practices. We consider faculty members should attend MOOCs too on topics they themselves teach and also on topics related to new educational technologies and pedagogies. Under these circumstances, each teacher could become a long-life learning and informed learner.

The blended learning model with MOOCs integration in which local learning communities are involved bring new pedagogical models, make xMOOCs more close to cMOOCs, add the connectivism and constructivism dimensions and values to the learning process.

Even if students don't effectively participate in a MOOC, the teacher / facilitator could present a list of MOOCs connected with the course topic, to make students familiar with this opportunity for high quality and continuing learning. This is a practice already used by the author, who have introduced a discussion on MOOCs in each facilitated course or in the teachers' training (for example the Didatec project).

For this particular course, with a wide area of topics, wrapping around a single MOOC would have been difficult. Based on the experience gained in this blended course, on the feedback received from students and the serious research related to blended learning with MOOCs, we will plan a more complex scenario for the next run of the course.

9.5. Teacher Training

With the emergence / increased use of Web 2.0 tools in education (Selwyn, 2009), a large number of institutions are embracing the opportunities offered by social media. However, although a whole literature and projects around virtual learning environments for formal education are being created, a relatively small number of studies and researches refer to teachers' continuous training both in formal and informal settings. In this context this study focuses on an approach based on microblogging, as a result of an exploratory study carried out over the last seven years, to support the efforts towards teachers' training and their continuous pedagogical professionalization.

9.5.1. Phases of teacher training

The practical part of this study focused on a question raised very often but almost never clarified: whether and how microblogging succeeds to be a quality factor in teachers' education. The social media application cirip.eu was chosen because it acts as a social network, as a multimedia microblogging platform, but also as a social learning environment. It is a dynamic, user-centred environment

(see Figure 9.5.1) that engages participatory experiences, collective learning, transforming the traditional, blended learning space in many ways:

- *Learning and Training.* In the last seven years, formal and informal courses and trainings (hosted in private groups) for teachers and trainers in schools and / or universities were organized by different institutions or during European educational projects. Courses and trainings run on the cirip.eu platform (like *cursmb*, *iac09*, *iac10*, *wetentm* etc.) have new educational technologies and social learning as central topics. The statistics, timelines, network sections and different visualizations of these groups proved a high interest and involvement of teachers (see Figure 9.5.1).
- *Practicing.* Usually the interaction in the groups and on the platform continued after the courses/trainings ended, the members continued to learn and to practise the knowledge gained during the courses, the continuous activity being illustrated by the timelines of the microblogs. The learning community built in each group was enlarged with cirip members such as students, trainers, teachers, and specialists, becoming a real community of practice. Almost all of the teachers who participated in formal trainings built their own Personal Learning Environment / Network (PLE/PLN) on cirip, which included:
    - Connection / communication / sharing ideas and resources with the users they followed.
    - Groups for national and international conferences, workshops, events, project management.
    - Sites / blogs / networks feeds and search feeds.
    - Social networks providing educational objects / OERs (Open Educational Resources), which can be included in messages etc.
- *Meta-learning.* In the special group on the platform dedicated to learning designs (The Learning Scenarios group - *lds*), the teachers discuss, validate and improve the scenarios of learning activities and courses they develop, formalizing them as mindmaps embedded in cirip notes. Another advantage is that they can also find peers for peer-mentoring their courses.

9.5.2. SWOT analysis for teachers' education

In order to shed light on the research question, we conducted a SWOT analysis of using the cirip latform for teachers' education, to ascertain their key competences and abilities of using it for personal / professional development.

Strengths

- Flexibility of the platform – access to public or private groups through a variety of devices and applications, by anyone with a cirip or Twitter account.
- Usability in terms of third party applications (ciripAPI, widgets/gadgets, export/import); aggregation of additional resources through RSS feeds/Twingly search engine (like blogs, social bookmarking systems such as delicious, social networking sites); tagging; searching; embedding multimedia objects; polling; visualizations; statistics etc.
- Openness to OERs - multimedia objects from social networks around OERs, embedded in messages, become part of the conversation/communication flow of the platform, and of the members' microblogs/portfolios. Such objects can be retrieved for documentation, but also can be created collaboratively by members. Let's note that microblogs, discussions on

different topics, groups, so different streams themselves become open educational resources.

- Mobile functionality through SMS or m.cirip.ro - enable ambient research practices (McNely, 2009).
- Breaking the ephemeral nature of conversational stream (McNely, 2009) – on cirip all messages are archived, and can be retrieved via browsing or searching.
- Real time access to knowledge – flexible / extensible time schedule for individual study.
- Raising awareness of a particular topic - using tagging or resending mechanisms, but also creating groups on specific topics.
- Mobilization through a facile access to other members' PLE/PLN. cirip allows asymmetric social relationships.
- Serendipitous learning - building knowledge spontaneously (Reinhardt et al., 2009).
- Collective learning and creating learning relationships. One can use cirip as a „laminated discursive space" (McNeill, 2009) to extend his/her social graph towards development of communities of practice and learning.
- Professional networking (McNeill, 2009).
- Encouraging participation (event the shy persons can be part of it).
- Teachers act like social reporters. Using a RSS feed they do not have to log in to cirip to receive updates, to aggregate conference proceedings etc. (Ross et al., 2010).
- Support collaborative research / projects run with students or others members.

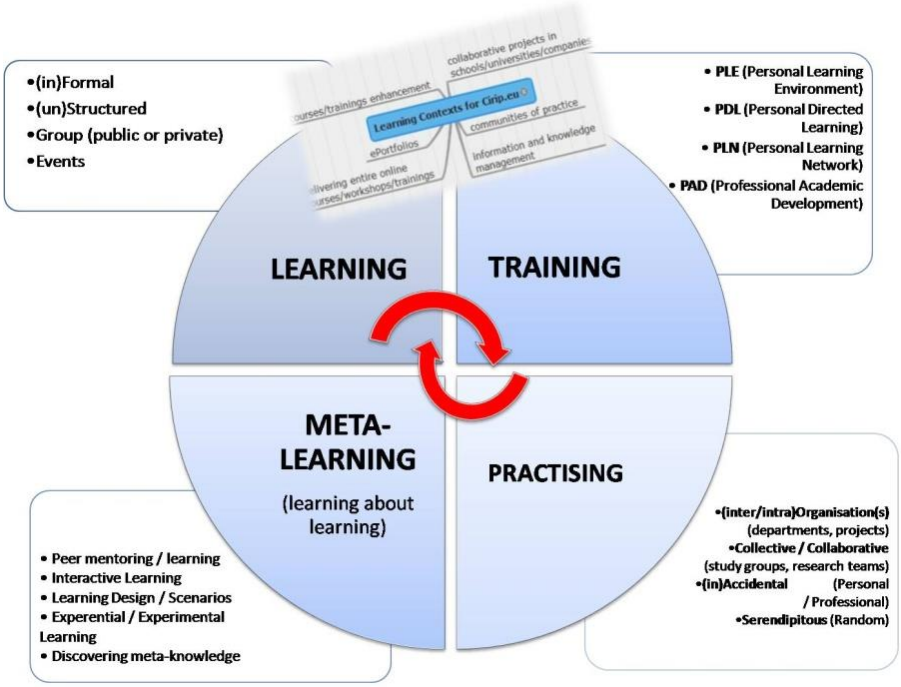


Figure 9.5.1 Learning contexts on the microblogging platform cirip.eu

Weakneses

- A (more) user-friendly interface when posting multimedia objects like presentations from slideshare, documents from scribd, music from deezer or blip.fm etc.
- Poor infrastructure – not all teachers have a broadband Internet connection (e.g. to engage in live-streaming can be sometimes difficult).
- Time costs – sometimes it takes too long to follow the informational stream.
- Fatigue occurs following a rich information flow.
- Informational expansion. Using the microblogging platform as a crowdsourcing tool can lead to a difficulty in making sense of the many conversations taking place simultaneously as relevant, useful, important or rich in content.
- A voluminous stream. Sometimes the teacher has to filter the flow in order to separate (properly) the noise from the real content (and to highlight the important notes according to his/her needs for learning).
- Multiplication of communication – for example if we supplement a recommended reading list with stream items during a training course, this can lead to a spread in too many directions.
- Simple syntax of messages: there aren't direct messages on cirip like on Twitter; nor can one mark as favourite a message/ a note – this operation is possible only in private groups.
- The lack of a critical mass participation – sometimes the curiosity is missing or there is a low interaction.

Opportunities

- Learn to Read Social Media stream (Couros, 2010). Microblogging is an alternative in learning from specific events (like conferences, workshops, symposia etc.), which could lead to informal learning.
- Engaging in active (and collaborative) learning; contribution to group learning; culture of community (Dunlop and Lowenthal, 2009).
- Enhancing creativity: teachers generating contents (audio, video, digital stories).
- Development for a new socio-literate practice enabled / facilitated by the microblogging technology: time and attention economy to find authentic resources on topics.
- Social story community. Documentation through messages in 140 characters can improve teachers' knowledge / content production.
- Augmenting social learning. The stream isn't just a social space governed by social conventions (Cogdill, 2001) but also a space for collaborative note-taking and shared learning experiences (Chang et al., 2010).
- Connecting teachers' PLEs stimulates curiosity, which enhances learning. Teachers share information with / from others specialists' / practitioners' microblogs. Furthermore, they can create informal networks with peers inside and outside of their personal networks.
- Could foster a form of peer-to-peer learning and mentoring (McNely, 2009): asking, following ideas / responses, learning from others.
- Scholarly resource (Serbanuta, Chao, Takazawa, 2010): gathering, archiving and making use of user generated content (conversational / informational / emotional / self-expression flow).
- Reliable source of news: citing cirip notes in projects and research papers (Dunlop and Lowhental, 2009) as electronic academic references. The message archive thus becomes a valuable resource for further studies.

As **Threats** we have identified: microblogging skepticism; time-sensitive contents; over enthusiasm / excitement; over interpreting the relevance of this training method; and sometimes a social peripheral behavior (bad language, sarcastic, critical / inappropriate comments – in literature the notion is snarkiness (snark=snide+remark). The practice of using microblogging can also lead to track only (attendees') reactions and not topical discussions (Shamma, Kennedy, Churchill, 2010). We also noted the technological stress - from the technical point of view some teachers could feel uncomfortable with platform facilities and above all the risk to emphasize only the technology and not the pedagogy.

As we have seen in the previous section, a teacher can participate in the cycle of professional development starting with any of the learning contexts (Figure 9.4.1). We have also noted that a number of teachers who have participated in formal trainings became mentors for other teachers or organized courses on cirip, this way changing their roles from trainees to trainers / facilitators. If Twitter and other microblogging platforms offer mainly the practice context, we consider that cirip could provide the formal training and meta-learning contexts, because of its special facilities. These facilities position it within the spectrum of educational services for an efficient continuous education, training, learning and personal development of teachers.

However, we aim by all means at dealing with the various issues raised during the teachers' learning evaluation process. First of all, a preliminary briefing of teachers is required – some don't know or fail to implement correctly this technology, while others won't adapt to the new requirements of integrating social media in their professional development. Then it is suitable to eliminate the effects of incertitude, as in the case of any innovation or change. Some of the difficulties are to create hierarchies of knowledge, to find and choose the relevant resources to post, and to elaborate recommendations for applying this technology in proper education environments.

And last but not least, it is necessary to develop a centered quality model in terms of characteristics, measurement indicators and evaluation criteria.

We also hope that this research represents a starting point / invitation to future reflections and studies for reviewing, expanding and validating the theoretical basis of using microblogging by teachers. Thus, although we refer explicitly to cirip.eu, our remarks are also applicable to other microblogging platforms / services (Twitter, Identi.ca, Plurk, Edmodo, Yammer etc). „Think of it this way: Microblogging is the way in which you choose to speak, while cirip.eu is the tool you use to talk to the world." (apud Livingston, 2010).

9.6. Personal Learning Environment

Although since 2004, when the term Personal Learning Environment (PLE) was coined (JISC, 2004; Wilson, 2005), a whole literature and projects around PLE and lately Personal Learning Network (PLN) are being created, a relatively small number of studies and research integrate the microblogging technology (Taraghi, Ebner, Till, and Muhlburger, 2009; BECTA, 2009; McNeill, 2010; Elch, 2010).

We have noticed that specialized literature is continuously changing and overcrowded with resources dedicated to PLE or to PLN in various contexts. Some of these are theoretical (Johnson and Liber, 2008) and/or methodological proposals (Ivanova, 2009a; Ivanova, 2009b; Taraghi, Ebner and Schaffert, 2009); others address new paradigms or filter the importance and place of each one separately

(Ivanova, 2010) or together (Skill, Carhart, Houton and Wheeler, 2010b). In some papers, the two concepts are set/put in antagonism, in others they are (re)invented. Regardless of the content, all these resources metamorphose in challenges addressed to e-learning specialists (Waters, 2008-2010) or practitioners (Hart, 2009). The intention is clear: we either give one up and promote the other (The King is Dead, Long Live the King!), or we (re)consider new opportunities (Attwell, 2007), new solutions of using them together in education (Downes, 2010; Buchem, 2010; Attwell, 2010).

From the conceptual and technological point and view, we appreciate that two approaches related to PLE implementation exist:

- mashups by aggregation (Attwell, 2010; Ivanova, 2010, Taraghi, Ebner and Schaffert, 2009); these solutions seldom consolidate a public profile/portfolio;
- integrated environment (Harmelen, Metcalfe, Randall, 2009); usually used during a course or a specific learning project, they don't incorporate the previous PLE, don't have the characteristics of continuity.

In this context this case study focuses on how the PLE can be built, modelled and conceptualized on a microblogging platform, as a result of an exploratory study carried out on the platform Cirip.eu, during the last seven years.

The *work hypothesis*:
How can a PLE be built, shaped and conceptualized on a microblogging platform?

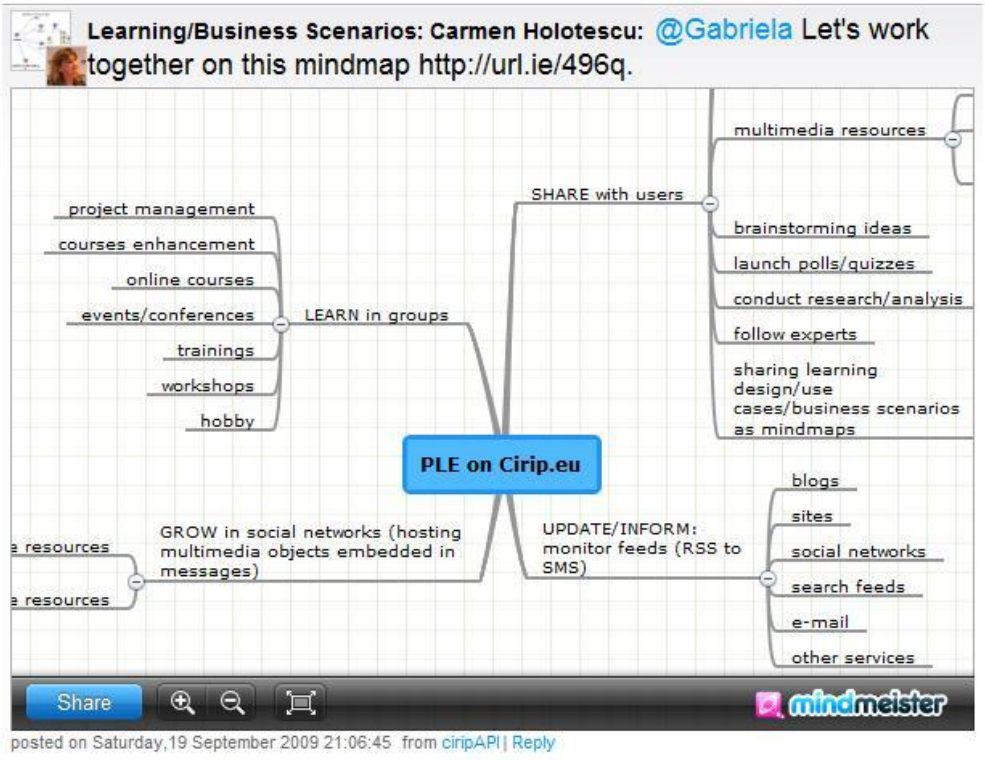


Figure 9.6.1. PLE on Cirip.eu (source http://www.Cirip.ro/status/1629920)

9.6.1. Three-Anagram's Approach to Cirip PLE Framework

On Cirip, we consider a microblog as *a three-dimensional space*: **E**nvironment, **L**earning and **P**ersonal. Following the three dimensions clockwise brings us to the construction of a PLE in three-anagram's approach:

a. LEP: Learning the Environment Properly

Cirip.eu integrates a wide range of Web2.0 tools and social networks organized around educational resources. The integration of these applications is realized in order to make them known, to organize and simplify their use, to encourage members (teachers, students and other learners) to discover, to explore, and to practice them; we can say Cirip offers an opportunity toward Open Educational Resources – OERs. Sometimes the use of the Cirip platform implies a prior instruction in order to obtain a real efficiency in exploiting all its facilities.

b. EPL: Empowering / Enhancement Professional Learning

In 2005 Jyri Engestrom, the co-developer of the Jaiku microblogging platform, launched a theory stating that, in most cases, people base their relations on certain objects, which he named *„social objects*". These can be both physical, such as „location", and semi-physical (such as „attention") or even conceptual, such as *„on-line presence*". According to Engestrom objects become the centre of any social relation and the nucleus/fundamental notions of a (strong) social network. Thus, it is important to use *web 2.*0 tools / social networking / educational resources not only as personal web technologies (McElvaney, Berge, 2009) but *as social objects as well*.

c. PLE: Personalize onLine Experience

Cirip allows the creation of a personal profile / portfolio including ideas, projects, research, information resources, multimedia objects created individually or collaboratively. All users' activities are developed in a dynamic manner and follow a continuous evaluation process by communicating with members of the platform and/or within the groups he/she is part.

On Cirip each member **can** build not only a PLE, but also a PLN which can include:

- connection / communication with the followed users;
- the groups they participate in, according to the topics of interest;
- the site/blog/network/search feeds;
- the social networks providing educational objects which can be included in messages.

Thus Cirip.eu can be considered a ***social network of PLEs*.**

9.7. Conclusions

This chapter presents the usages of the platform in many formal and informal learning contexts:

1. for Online Courses and Courses Enhancement in high schools and universities,
2. for Learning from the Stream,
3. for integrating MOOCs in Blended Courses,
4. for Teacher Training, and also
5. for developing Personal Learning Environments.

Each case study presents the possibilities offered by other microblogging platforms for that particular usage and also the advantages and drawbacks of Cirip. All these case studies are part of the third DBR phase, aiming at testing and refinement of the platform, also at reflecting and innovating open pedagogies.

9.7.1. Contributions

Cirip is allowing the creation of a personal/public profile and/or portfolio including ideas, projects, research, information resources, multimedia objects created individually or collaboratively. Thus on Cirip each member to be able to build not only a Personal Learning Environment but also a Personal Learning Network.

From this perspective and according to classifications of Stutzman (2009), Cross and Conole (2009) and Engeström (2009), Cirip is both a *profile-centric* and a *social object-centric network* :

6. the objects are part of the communication-conversation flow of the platform;
7. the objects connect Cirip with other Social Media applications organized around educational objects;
8. objects can be reused, validated, created or recreated individually or collaboratively, thus Cirip offering the opens to Open Educational Resources – OERs;
9. *meta-objects* meaning *objects of learning design - LD* can be created; the *objects of learning design* specify learning scenarios, best practices for integrating new technologies (Cirip in particular) in education; Compendium scenarios can be imported to reach the experience of other communities of practice in LD;
10. by extension, public or private groups can be considered as *social objects*, functioning as sLMSs (social Learning Management Systems).

The platform most interesting usages in education were exposed in this chapter, ***representing pedagogical innovations***:

1. for Online Courses and Courses Enhancement in high schools and universities,
2. for Learning from the Stream,
3. for integrating MOOCs in Blended Courses,
4. for Teacher Training, and also
5. for developing Personal Learning Environments.

Chapter 10. Platform Evaluation

10.1. Introduction

Since the launch of Cirip in March 2008, the platform was continuously evaluated by students and teachers who have used it during courses and for professional/personal development. The feedback was obtained through:

- messages sent by users to @cirip, the administrative account
- specific surveys applied to different categories of users or to participants in different courses/workshops.

The results of two surveys are presented in this chapter and they are part of the Design Based Research (DBR) fourth phase (Figure 2.3). The conclusions drawn from the surveys have been used for the platform refinement/improvement.

10.2. Study of Learning Impact

10.2.1. Research goals and methods

The generic purpose is that of analyzing the way in which didactical actions associate with the microblogging technology used as a social LMS type of course platform:

- *context and digital resources*: how the course content is presented, both through formal *Announcements* section for accessing course modules developed by teacher, and through multimedia objects embedded in messages (as littler OERs);
- *the teaching/learning methods used* – identifying the didactical directions suitable for the courses run on microblogging platforms, such as: teaching by questions / discourse / conversations, academic controversy, digital storytelling, micro-lectures, case studies, collaborative projects, problem based learning, teaching by collaboration, learning from events etc., by clear direct examples, within the courses developed both in a formal higher education environment and an informal one (adult, continuous education);
- *students' learning and study strategies*: presenting typical learning activities and methodological suggestions for these; identifying the personal learning styles developed by students and analyzing them, etc.
- *evaluation of students*: by using e-portfolios, personal learning environments, learning diaries, but also their *real experiences* during courses (either in a blended or online course);
- *diagnosis of critical situations (identification of risks)* when using the microblogging as a study technology.

The research question (for the overall study) is: *whether and how does microblogging succeed as an efficient and flexible social LMS?* And how the quality of the learning experience and learning outcomes could be improved.

The examined population consists of students in several years and forms of study, covering a variety of profiles and specializations from three universities (University Politehnica Timișoara, West University of Timișoara and University "Ioan Slavici" Timișoara), enrolled in formal courses hosted in private, closed, blended-

mannered groups on the Cirip platform, during the academic years 2009-2011.

Table 10.2.1. Courses demographics

Study level			**Specialization**				**Gender**	
Under-Graduate	Master	Post-graduate	Social	Political	Technical	Other	F	M
129	27	15	54	57	48	12	122	49
171			171				171	

Our research has two forms:

- *An online survey applied to students*. The survey was made up of various types of questions (open-ended ones included). We had to confine ourselves to essential questions, not only for obtaining a good response rate, but also to save the time needed for filling out the questionnaire (because it is known that long ones lead to students giving up the completion or to superficiality from the respondent). It was delivered as an online form (created on Google Drive) embedded in a group message and also in the Announcements section. Students could answer either online or by mobile phone.
- *The analysis of the message corpus* relating to the courses. The resulting archives were analyzed by using quantitative and qualitative methods offered by the platform, such as various statistics (the number of participants, the most active participants, the number of links posted, the number of digital objects included in the notes, the time period, the method / device used / access etc.); tag clouds (in the course we used some specific hashtags to identify topics of interests); visualizations etc.

In order to evaluate how students consume the course stream we have built a list of primary impact elements in using the microblogging technology as social LMS:

- *Students' attention and participation*. How many students participate (online access through web interface, mobile devices, 3rd party applications, Twitter or instant messaging). How often and when/from where (during the course, in the morning/evening etc.)? How many messages did they write (the frequency)? And which method do they use to post (CiripFox, CiripApi etc.).
- *Content sharing*: How many links, blog posts, photos, videos, audio clips, comments, presentations, files etc. did the students share? How many RSS feeds did they follow? How many public groups did the students participate in? Which is the taxonomy of the students' intentions? Did they use a specific tag? etc.
- *User-generated content created in a variety of formats*: upload of students' papers / other own or collaboratively created presentations, digital stories-telling etc. (Luzón, 2009).
- *Dissemination of suggested class readings.* Did students manage to identify the trending topics? How many redistributed messages to others? And within what time interval? The temporal dimension is often overlooked by teachers (Ross et al., 2010). Do they curate the content course in a personal manner?
- *Exploring notes vocabulary*. By using the platform facility for generating words clouds for microblogs/groups to analyze the vocabulary of students' notes posted in their academic group, it is important to see the relevance to the course topics and leverage the results for a better learning.

- *Peer-to-peer learning and mentoring* enable students to expose their ideas to peers and construct knowledge and understanding.
- *Mobilization among students* - expanding students' PLNs.
- *Formative assessment*. In order to obtain the students' *feedback* for identifying a number of aspects regarding the use of microblogging in their learning experience, we used Kirkpatrick's e-learning evaluation model:
    - The first level *„Learner Reaction"* indicates the extent to which students liked the course and its facilitation (*How did they feel during the course?*) Filling out the questionnaire right after the course can offer important information on the relevance of the objectives, the teacher's ability to deliver the content and to maintain students' interest, the interactivity of exercises, the communication with the teacher, the value perceived etc.
    - *Learning Results* measure the level of knowledge and skills / attitudes acquired by the students throughout the course (*Did students learn* anything?) In order to quantify these results, an assessment was proposed to students as a reflection game before and after the courses (i.e. the #stiu tag, „I know" in English), the testing modality being conceived within 140 characters. By analyzing the responses of all participants, the impact of the teaching can be determined.
    - The third level *„Learning Behavior"* examines whether the students make use of the new knowledge, both in future courses and in daily life (*Do they apply what they learnt?* Did their behavior change?). A new approach should be idealistic, at least 3-6 months after the courses in order to allow for assessing their retention degree and for empowerment evaluation.
    - *Learning Results* measure the impact on the educational process resulting from student performances in a larger context (other universities, other courses, trainings at different levels etc.).

10.2.2. Data analysis

A sample of 171 students resulted after validation. Because there are no significant differences from the point of view of gender, specialization, study level between students from the three universities, we shall not examine separately by the demographical characteristics in Table 10.2.1. The most important findings are presented below.

Paradoxically, the most suspicious about the role of microblogging in educational activities are not teachers, as we might have expected, but students (replies to the question *Did I enjoy the platform?* with answers given on a 1 to 10 scale: 1=not at all, 10=very much). Thus, by analyzing their microblogs (some of them personal, some educational, seen as e-portfolios or mixed) we noticed that students responded differently to the introduction of the new technology in their curriculum and *encountered five types of learners*:

- *The optimistic* – a small part, who used the platform exceedingly (7%).
- *The fascinated* – who tried to discover the way technology itself functions (and what it is used for – 25%).
- *The hostile* – restricted themselves to performing work tasks, any task being seen as an effort, a loss of time (2%);
- *The skeptical* – always wanted to have solid arguments in favor of using such a technology instead of a traditional LMS, such as Moodle (2%). From

most of the times we received questions like: Why do we have to do this on Cirip? Why is this a new learning environment?

- *The daring* – students who understood that microblogging stimulates didactical activities, by breaking the frameworks of a traditional e-learning education (34%).

Hence the necessity to get familiarized with the environment i.e. to acquire the working method and to possess the working skills through a *pre-instruction session (training)* in order to be able to use the microblogging platform as a LMS for disciplines other than the technical ones.

Related to *pedagogical usability* of the platform:

- More than half of the students (56%) assessed it with the maximum rating
- 25% of students accepted Cirip as an environment for organizing the course preparation (for learning and accomplishing learning objectives)
- 10% thought that motivation and interest for using a microblogging technology does not depend however on the technology itself, but on the interest in examining more thoroughly the studied discipline supported by Web2.0 technologies
- Only 9% qualified negatively the platform, mostly those who used the environment only for accomplishing course assignments.

In order to measure the skills (Trilling and Fadel, 2009) achieved by students we asked how the microblogging platform helped to acquire new knowledge and ideas. To the question *Did I learn what I needed to, and did I get some new ideas?:*

- 55% of the students said Cirip serves learning purposes,
- 35% that it helps them acquire and transfer knowledge and
- only 10% (as a cumulative percentage) that it doesn't facilitate learning.

As for the utility of courses on a microblogging platform (*Did my students learn something during my course?*), in relation to students' real needs:

- most of the students (39%) are of opinion that the activities developed are appropriate,
- but the development of an efficient educational act with the help of this technology implies direct experience and exercises (35%)
- 26% of the students consider that courses should be improved, supported by simulations and practical accommodation exercises.

One of the investigated aspects to improve a curriculum structure based on microblogging technology was also the effectiveness of the topics presented during the courses:

- Thus, half of the students (43%) were satisfied with the course content, while 24% were thrilled by the topics included.
- It is encouraging that only 5% considered the course content technology-dominated, without meeting the pedagogical objectives intended (4 students did not answer).

What we intended was not to present a definite and sterile classification of our students' learning styles, but only to find some landmarks, some useful references for developing new competences and abilities to support the already acquired ones, which should assist the student in finding his/her own learning style. Thus, it seems our data indicates that a technology-rich environment leads to a bigger impact. More integrated technologies and applications, more (learning) benefits. Table 10.2.2 presents how students appreciated and how they used during the courses the special features of the platform, such as embedding multimedia objects in messages, RSS feeds monitoring, advanced searches, visualizations, word clouds, statistics, polls and quizzes, and live video.

Table 10.2.2. Uses of Cirip features

Web 2.0 applications used by students	**No.**	**%**
Photos (flickr, picasa, albums, tinypic, any image or picture with a CC license)	122	72%
Videos (youtube, vimeo, dotsub etc.)	127	74%
Audio (blipfm, deezer, vocaroo, eOK, trilulilu, any mp3 file)	74	44%
Presentations and files (slideshare, voicethread, photopeach, glogster, authorstream, prezi, Google Drive, Scribd, any online file etc.)	116	69%
RSS feeds	33	20%
Searching (users, groups, events, text etc.)	53	31%
Tagging (word clouds, statistics, visualizations etc.)	32	19%
Polls / Quizzes / Surveys	61	36%
Live Video / Streaming	48	28%
Other	2	1%

As for the utility of communication with other platform users, half of the students approve that the access to information, without the mediation or the counseling of the teacher/facilitator is benefic. Extended learning possibilities, without resorting to the discipline coordinator (by avoiding academic language as well), implies also the presence of those elements which are often overlooked when studying: the social specificity and the cultural context.

An important question for involving peers in user-content creation emphasized that the communicative element is essential. *Were students technologically savvy? Comfortable about sharing information, knowledge, best practices in an open environment?* 36% of the students state they used the platform only for accomplishing the course assignments. The time spent on the platform besides performing the educational assignments is 5 percentage points lower for the students who stated they spend around one hour (18% half an hour and 14% almost an hour). By analyzing the access differences for students stating they use Cirip more than an hour (32%), we notice that the attention given to the platform comes from students who have blogs (19%) and twitter accounts (20%).

Given that the use of mobile devices has not been foreseen in the curriculum from the beginning, depending in fact on the students' financial support (not all of them can afford an Internet connection on the mobile phone for consulting educational resources or posting multimedia objects etc.), we had to limit ourselves only to using SMS in order to integrate the educational content in an e-learning environment supported by the microblogging technology. Thus, the extent to which students are aware of the possibilities of using information/documentation, communication and collaboration on the platform with the help of mobile devices, was aimed at directly by two questions where students assessed on a 1-5 scale (1=not important, 5=useful): 46% appreciated monitoring via free SMS as useful, while 19% found this feature not important.

These initiatives could prove crucial in the context of the „4A" vision: Anywhere, Anytime, by Anyone and Anything, and for becoming aware of the key element in the future of the information society: the *ubiquity of networks*.

The key to success in using microblogging as a support technology is the students' motivation – as well as teachers becoming aware of the relationship between the students, the technological environment / platform and the proposed learning / education activities. We shouldn't reach the situation when students feel disconcerted.

10.3. Study of Professional Development Impact

This study is connected with the one presented in Chapter 5 and part of our broader approach regarding how researchers consume social media in general and microblogging in particular. The overall aspects to be investigated are: social media impact on scholarly communications and on researchers workflows; attitudes towards social media as a research tool / technology and patterns of adoption; challenges, opportunities and trends as well as limits and barriers of / to adoption and research good practices, techniques and policies. In this study we focus on ways in which academics relate to microblogging, in particular with Cirip platform.

The role of using microblogging for educational purposes (in teaching and learning processes or during different scientific events etc.) has been explored by numerous scholars (Grosseck and Holotescu, 2008; Holotescu and Grosseck, 2009b). However, there is little consensus within academic community that they could benefit from adopting the microblogging simplicity, easy-to-use and functionality for scholarly purposes (Cann et al., 2011). Thus, although the majority of the scientists avoid to use microblogging in their research activities (University College London and Emerald Group study from 2010 indicated a 9.2 percent of academics that include microblogging in their research), there are some who have found value in it (Bonetta, 2009).

However, recent studies (Mayernik and Pepe, 2009; Procter, R. et al., 2010a) suggest that microblogging as "part of the new reality media landscape" (Gilpin, 2010) has the potential to change the way researchers work, communicate and collaborate. Furthermore, through microblogging they have a possibility to disseminate their findings "more rapidly, broadly and effectively than ever before" (Ovadia, 2009), to use it for "more serious tasks", "often highly productive" and near to their academic / scientific profile / specialization or position (Priem and Hemminger, 2010).

An example of microblogging role in all the phases of the research lifecycle is the CIBER report (2010). Their findings suggest that microblogging supports "from identifying research opportunities to disseminating findings at the end", with greater impact on information sharing and dissemination.

Popular microblogging services used in research are: Twitter, Friendfeed, Cirip or ScienceFeed (http://www.sciencefeed.com). The last one is a microblogging platform dedicated to the online scientific community acting as a "bridge between online scientific networking platforms, scientific databases" and scientists from all over the world.

At the question of Mayernik and Pepe (2009) *"Can micro-blogging be used for field research?"* we noticed in the literature some answers of the most frequent uses for different research contexts such as the following:

- a new form of *scholarly communication* (Collins and Hide, 2010): "answer other people's questions" or "ask questions relevant to your practice" (Costa, 2010; Costa, 2011), getting in touch with science journalists, science organizations or doctoral students, get advice on how to improve research;
- a new form of *authoring, publishing, researching* (Greenhow et al., 2009);
- a tool for *disseminating scientific information,* including the own results (Moore, 2011);
- a *social collection* to manage (Cann et al., 2011):
  - *people* (e.g. to follow list of researchers on Twitter)
  - *messages* (favorite notes, to resend / to comment - @ / RT; D for scholarship authority or supporting critical discussions)

    - *hashtags* (social news, following scientific events) etc.;
  - a *data repository* to collect (Collins and Hide, 2010);
    - *information* from science newsfeeds and from various individuals / institutions;
    - *links* to other valuable resources;
- a *search tool* "more appropriate for capturing hypercurrent information" (Ovadia, 2009);
- an *outreach tool* aimed at promoting public awareness (and understanding) of science and making informal contributions to science education;
- a *platform for social micro-interactions* to connect people (building personal relationship with other researchers, co-colleagues) and also to engage in conversations with an active community of scientists (Gilpin, 2010; Priem and Hemminger, 2010);
- a *way to track trends-in-time* like natural disasters or political events, mentioned in messages (Chew and Eysenbach, 2010);
- *a micro-peer method* for learning, reviews, feedback etc.

Other studies suggest that the researchers' behavior changed due to the *social participatory process* in micro-sphere (Procter et al., 2010b) stressing the need to create an online research profile on microblogging, what we called a *scholarly identity 2.0.*

In 2011, when this study was developed, even if Twitter celebrated five years, in Romania microblogging started to attract users interest in 2008, only 15% of the accounts of the Romanian Twittosphere being older than two years (*ZeTweety*, 2010). Since 2008, studies on microblogging were published, projects related to this technology were implemented, also Cirip.eu - oriented on education - and other microblogging platforms were launched (Grosseck and Holotescu, 2008; Holotescu and Grosseck, 2009b).

For the purpose of this study, we tried to estimate the size of the Romanian edu-microsphere, evaluating the total number of accounts and the number of educational accounts on the most used microblogging platforms.

Table 10.3.1. Romanian edu-microsphere in 2011

Platform	Total number of users	Teachers / Researchers	Doctoral / Master students	Estimation
Twitter	50000	400	3000	Total number [ZeList.ro]; evaluation of number of educational actors based on study RoTwitterSurvey2010 (Zetweety, 2010), specific Twitter lists, searches with twellow, tweepz.
Cirip	18000 (130000 in Jan 2015)	250	600	Platform statistics, educational microblogs, groups for conferences / workshops / courses for Master students / teachers.
Edmodo	200	30	140	Literature referring to platform testing was examined; also courses from University of the West Timisoara are hosted; private accounts.
Yammer	200	20	10	Literature referring to platform testing was examined (Ceuca, 2009).

Plurk	500	30	40	Accounts from Romania found by Google were examined, together with followed and followers' microblogs.
Google Buzz	800	100	100	Similar Plurk
Identi.ca	500	50	50	Similar Plurk
Jaiku	200	30	20	Similar Plurk
Twiducate	150	30	100	Similar Edmodo
Total	*70000*	*1000*	*4000*	*Approximation by rounding*

10.3.1. Study Methodology

For collecting the necessary information, we conducted a survey distributed online through blogs, also tweets, private messages and messages to groups on microblogging platforms (Twitter, Cirip, Identi.ca), messages on social networks (Facebook, LinkedIn), also via email academic lists from different universities and professional groups. Our approach for the survey invitation was for education in general and not specifically for research area, in order to avoid an over-representation in the sample of the researchers a priori more interested in this technology. Thus, the target population consists of faculty members, academic decision makers, administrative staff, technical community, teachers, trainers and PhD candidates and master students from universities, educational and other research institutions.

Data collecting was performed between 7 and 15 March 2011. A sample of 233 persons resulted after validation, the value representing a percentage of 4.66% of the total of 5000 educational accounts, as resulted from the above estimation.

10.3.2. Findings

- **Respondents Profile**

Based on the findings obtained from the sample group we'll begin with a brief profile of respondents. *Who are they?* By gender 123 are male (53%) and 110 female (47%). By age, as we anticipated, the higher percent is allocated to the young population - two thirds (75%) having less than 35 years. On junior positions in academia there are 19 percent and PhD candidates / master students around 51 percent.

Table 10.3.2. Distribution of respondents by age

131 individuals (56%) were less than 25 years of age
44 (19%) are between 26-35 years
37 (16%) of them were between 36 and 45 years of age
19 (8%) are between 46-55 years and
only 2 of them were older than 55

The predominant positions in academic community that are using microblogging platforms in their research belong to:

- *staff teaching*: professor (associate, assistant), lecturer (senior, junior)
- *researchers*: fellow, assistant, contract, seniors
- *students*: doctoral (PhD candidates), master
- *faculty staff*: librarians, administrators, trainers (online programs, adult education etc.)

- *others*: experts, decision makers etc.

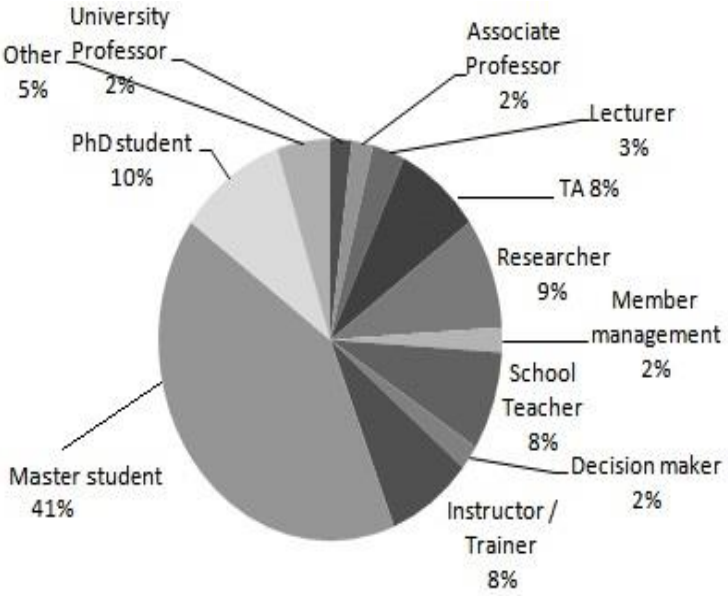


Figure 10.3.1. Respondents by academic position

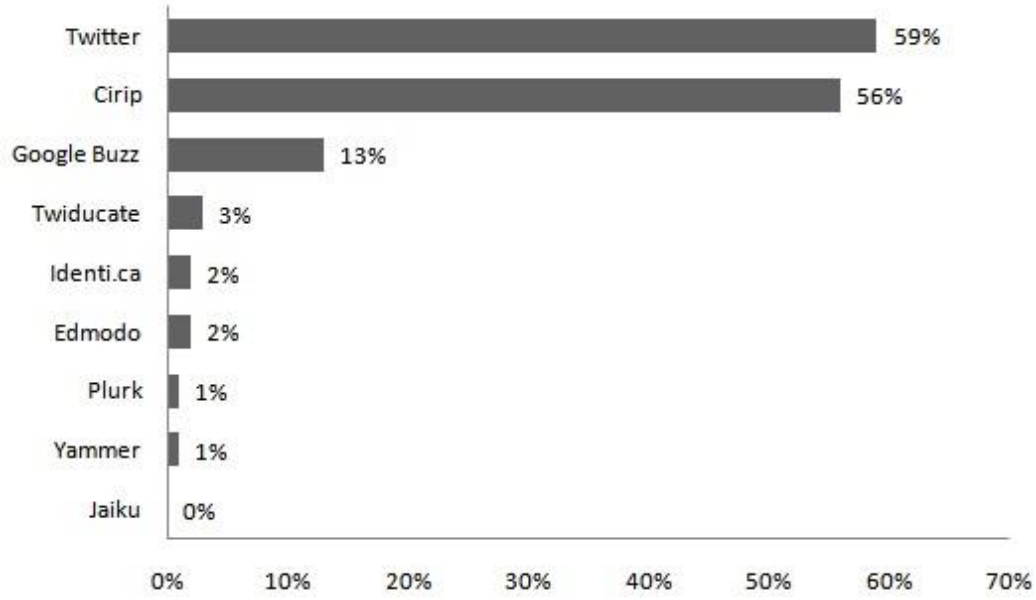


Figure 10.3.2. Microblogging platforms used by responders

Microblogging seems to be more popular for master (41% of responders) and doctoral students (10%), junior researchers (9%), teachers (7%), and teaching assistants (8%).

Regarding the microblogging uses in research by discipline (percentages by area of specializations), the dominated voice belongs to 58% of the respondents having a science background education (math, physics, biology, computers, engineering etc.). Although the percent of respondents from the humanity field and economics is less than 20% (19%), together with social sciences responders are a small, but very influential audience.

The results obtained confirmed the findings of the RIN study (Procter et al., 2010a): how researchers communicate their work varies in different subjects or disciplines.

This section highlighted only some descriptive statistics. Although demographic correlations observed on demographic data base (such as "a greater degree of adoption is positively associated with younger age groups and with more junior positions" or "the older age group is more associated with quality of being a scientist") are shaping the demand for microblogging as a research tool, these issues will be addressed and detailed in a future research.

- **Microblogging Accounts Profile**

A second group of questions collected data about the moment the responders started to microblog, on which platforms, how often they post, how large are the networks developed, and their presence on other social media.

The question *"How long have you been microblogging?"* is in closed relationship with understanding the microblogging research community. Thus, the data obtained about microblogging adoption behavior follow (in a certain way) the percentages of Rogers' innovation types: 7% are innovators (opened the first microblogging account more than 3 years ago), 11% are early adopters (opinion leaders with accounts of 3 years old), 35% early majority (2 years), 29% late majority (one year) and only 19% are laggards (accounts opened during the last 6 months).

The findings for the question *"What microblogging platforms do you use?"* (Figure 10.3.2) show that Twitter, Cirip and Buzz from Google are the most popular. However there are several academics that have more than one microblogging account. Pairs Twitter-Cirip and Twitter-Buzz are the most dynamic (Buzz was discontinued by Google on December 15, 2011).

How often do you post notes / write on microblog?

The most active users write daily (15%), but almost half of the respondents (47%) say they seldom send a note / message. However, it seems important for us to underline the fact that 23% post weekly, which can reveal a lot about a possible habit of using the microblogging technology. We hope that the rest of the respondents will become more engaged over time.

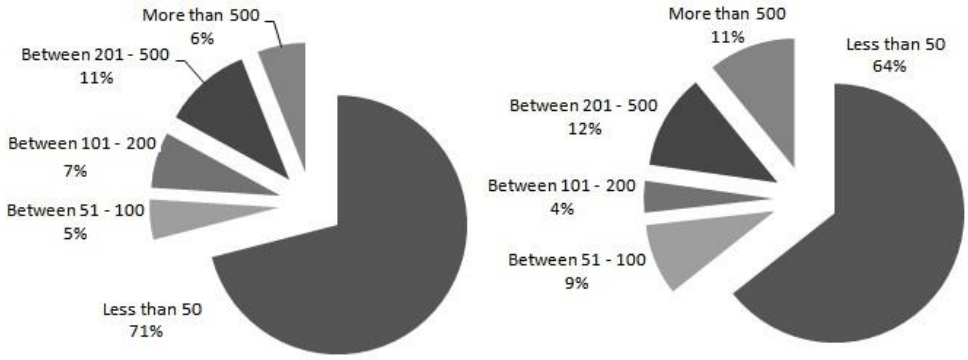


Figure 10.3.3. Followed users and followers

Analyzing the responses for the questions *How many microblogging accounts do you monitor?* and *How many followers do you have?*, we observed that more than half of the respondents follow and are followed by less than 50 users, which can suggest both a rigorous selection of sources of information / communication, and a judicious use of time spent on microblogging platforms. The fact that 11% of responders are followed by more than 500 users demonstrates that a significant number of educational actors have imposed as strong voices in microspheres, each one acting as "indicator of social capital than followers count" (Gilpin, 2010).

Table 10.3.3. How researchers are making use of languages

	Number	**Percent**
Only in Romanian	60	26%
Only in English	20	9%
Both in Romanian and English	144	62%
In other languages (including Romanian)	7	3%
Only in other languages	2	1%

62 percent of the respondents prefer to write both in Romanian and in English, 26% only in Romanian and 9% in English. We can assume that the quarter who write only in Romanian are those responders who use microblogging only to work with the community inside their institutions or from other Romanian institutions. Moreover, only a quarter said they use microblogging to collaborate with colleagues abroad and for personal research, which justifies writing in languages other than Romanian.

Did you get familiar with microblogging during a course / workshop or project?

The number of persons (50% - 116 persons) who declared themselves as self-taught about the microblogging technology is equal with the number of those who participated in different training social media programme (50% - 117 persons), such as university courses, dedicated workshops etc. Most of the latest are teachers and master students who participated in courses and workshops we facilitated on Cirip, microblogging being a topic in very few Romanian formal or informal courses.

Table 10.3.4. Social Media experience

Social Media Applications / Networks	Number	Percent
Blog (any type of platform / Blogger, WordPress, weblog.ro etc.)	102	44%
Miniblog (Tumblr, Posterous)	21	9%
Social Networks (Facebook, LinkedIn etc.)	200	86%
Image sharing (Flickr, deviantART etc.)	107	46%
Video-Sharing (Youtube, Trilulilu etc.	161	69%
Audio-Sharing (Blip.fm, Eok.ro etc.)	37	16%
Social Bookmarking (delicious, diigo etc.)	109	47%
Others	37	14%

Of all of respondents, 86% have a networking presence on sites like social networks (Facebook) or professional networks (LinkedIn) and almost half (44%) have a blog (networks and blogs being also important channels for research). We also tried to find out the correlation of using microblogging with other social media tools by the same person. The data show that the most frequent pairs are *blogging - microblogging* and *social networking - microblogging* and the least used is *microblogging - social bookmarking*. Those academics who microblog are more likely to engage in blogging and social networking activities.

- **Practices and reasons for microblogging usage in research**

A breakdown of educational actors' awareness of using microblogging by educational actors in different activities is shown in the following table.

Table 10.3.5. Microblogging usages

Activities	Yes – I have used	Not yet, but I'm aware of it	No
didactical activities	45%	21%	34%
research activities	27%	27%	46%
professional development	51%	22%	27%
personal development	**64%**	**17%**	**20%**

The greatest and smallest percentages are for "personal development", with 64 percent of academics actively using microblogging in their own practice and 20% of the mainstream faculty and academic decision makers who do not understand its purposes. Thus, awareness of using microblogging for scholarly purposes confirm our expectations - no significant difference between those who already used it for research (27%) and those who foresee themselves using microblogging in the future (again 27%). However, the survey showed there is still a large group of educators (46%) who believe that microblogging has no place in research: quite a few respondents expressed a willingness to give microblogging a try (27%).

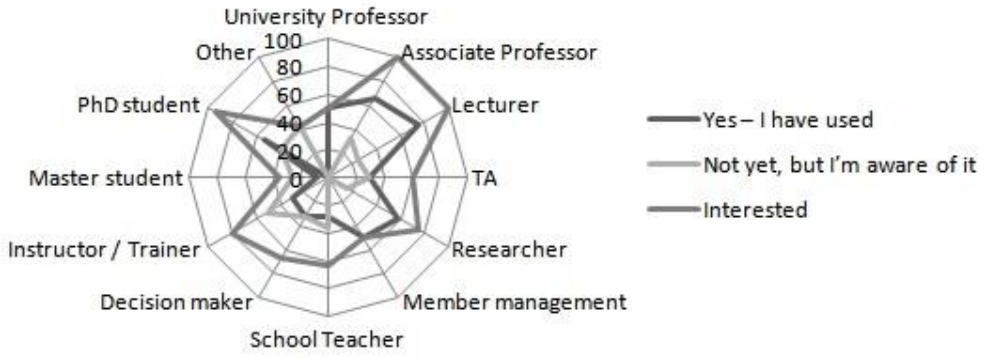


Figure 10.3.4. Use of microblogging in research by different didactic profiles

We analyzed deeper the interest for using microblogging in research by different didactic profiles, the result being represented as a spider diagram, where Interested means someone who uses or intent to use microblogging in research. The highest percentages are registered by associated professors and lectures (100%), also by doctoral students (94%), while the lowest interest is from master students (35%) and librarians.

Which one of the following options best described your style of research working?

Regarding the mode of research work we see that there is a tendency to work with colleagues outside the institution and even from abroad, as confirmed by the previous fact that a high percentage of responders write in another language than Romanian.

Table 10.3.6. Mode of research work

I work with …	**Number**	**Percent**
Collaborators in different institutions from Romania	79	34%
Collaborators in different institutions from other countries	63	27%
Colleagues / peers across my department / faculty / university / institutions	54	23%
Students of my own department / faculty / university	102	44%
I work on my own research or scholarship	54	23%
Others	72	31%

Which of the following activities do you use in conjunction with microblogging?

The most common types of uses of microblogging by scholarly community that have been revealed by our findings are included in the following table.

Table 10.3.7. Contextual conditions in which scholars use microblogging

Activities	**Number**	**Percent**
Searching news, academic content	130	56%
Dissemination of own results articles, projects, presentations	110	47%
Inquiring (reviewing the literature, collecting and analyzing research data)	51	22%

Personal / Professional Communication / Collaboration	**171**	**73%**
Networking for professional development	88	38%
Building a community of practice	39	17%
Building a learning community with students enrolled in formal courses	61	26%
Learning from the stream (following a specific hashtag) - participating / following different scientific events (as a real time news-source)	95	41%
Others	51	22%

The highest percentage of microblogging users (73%) manage and share certain personal information with others, look for expertise on very specific questions or to support and be supported by peers, while less than 20% (17%) were community of practice building oriented.

Overall, the findings indicate that microblogging is used by academics in different ways:

- The *search for scholarly content* remains a favorite activity, 56% of academics are looking to discover new information, ideas or practices. By looking for specific ideas the researcher can scan easily the stream for news other than academic papers, science magazines, data bases, scientific discoveries etc.
- It seems that the use of microblogging as a *dissemination channel* for promoting of own results / articles / projects or studies / formal products has a greater importance for 47% of respondents.
- 22 percent say that microblogging is an important tool for *reviewing the literature*, *collecting and analyzing research data*, "for listening what other researchers are going to say" (Gilpin, 2010).
- Talking and *sharing experiences online*, communicating scholarly ideas, collaboration between colleagues, networks of stakeholders, and other contacts are favorite activities for 73% of academics.
- Building a *network of contacts* for research opportunities, finding sponsors, reaching fellow specialists was indicated by 38% of the responders. Thus the development of a Personal Research Network (PRN) is appropriate not only for "establishing professional expertise" but also for "professional identity construction" (Gilpin, 2010).
- Only 17% of the respondents believe in the power of sharing, skills development or knowledge creation by building a "social scholarship" (Greenhow et al., 2009; Costa, 2010; Costa, 2011) in *communities of practice*.
- A 26% percent shows a low participation within *learning academic community*, student centered. Thus we can say faculty members are (still) unprepared to deal with incorporating microblogging technologies into their courses.
- Nowadays following conferences and posting from scientific events (with a special hashtag) is a common practice. Thus, the usage for *monitoring scientific events* is encountered at 41% of the respondents and may fall in one of the following categories: communication before, during and after the event, using microblogging as official, quasi-official or unofficial back-channel, for collaborative keynotes, feedback etc.

- An important percent (22%) say that they use microblogging for scholarly publishing and capturing contextual information (Mayernik and Pepe, 2009).

The survey also included two open-ended questions, asking respondents to identify the benefits and the most important barriers (and constraints) to uptake when using microblogging for research activities; while more than half signaled advantages (52%), only 39% listed disadvantages.

The benefits expressed by participants can be clustered in the following types:

- *Collective Intelligence*: communication; collaboration with a wider audience of specialists, sharing ideas and perspective, interdisciplinary research; collecting / surveying / filtering data and resources.
- *Ambient Intelligence:* visibility and validation of projects, results, professional portfolio, recognition.
- *Extension of the PRN – Personal Research Network*: building and engaging (in) a relevant community of scholars / of practice, beyond geographical, cultural and linguistic barriers; mentoring colleagues; transfer of knowledge between researchers; help in problem solving; build networks to support research (and researchers' career); access to OERs and collaborative applications.
- *Managing the researchers*' *projects*: research publishing; tagging contents; getting notified using RSS feeds.
- *Developing as a researcher:* improving digital and professional skills and competencies, help for academic career.

Of the 233 respondents, 39% added comments highlighting disadvantages, barriers or limits of integrated microblogging in education. Based on these responses, it appears that academics are less open to trying Twitter or other microblogging platform in their research workflow. Overall, most of the comments can be included into one of these categories:

- *Ethical dilemmas*: authority; coping with a large amount of information (Collins and Hide, 2010); the level of acceptability to collect, archive and analyze data from the stream (Vieweg, 2010); "authenticity of crowd sourced information" (CIBER, 2010); intellectual property rights; new forms of peer review and approval, such as retweeting (for e.g. resending messages without giving credit); social citation sharing; trust ("scientists are hesitant to use the open Web as an incubator for ideas and would rather rely on a tight circle of trusted individuals" (Saunders et al., 2009)) etc.
- *Concerns about Quality:* quality of ideas / information / assurance (poor studies, no substantial academic / scientific values; banality); drain on resources; too time consuming; reliability and expertise of microbloggers; disorganized information (sometimes a chaotic stream); common language (the human chemistry is all adrift); poor linguistic conventions (for e.g. difficulty of writing a math formula); limited communication options (short messages - only the length of a SMS); week feedback etc.
- *Security and Privacy Concerns:* information overload; noise; spam; juxtaposition with the personal life; confusing in following too many interactions (Cann et al., 2011); uncertainty of the identity of sender; plagiarism, lack of a code of microblogging ethics (Shepherd, 2009).

We intend to re-apply this survey according to some lessons learned. Thus, next studies could include questions and issues which were not present in the current survey, in order to establish a more specific edu-microblogger profile, such as:

- the account is personal or official (an institution, a project, an educational marketing campaign etc.)
- public or private accounts
- region or country of researcher (if part of the diaspora)
- which information are included in the online profile (name, institution, blog, how username was chosen)
- duration of work in higher education
- how microblogging platforms are accessed (online, by mobile devices, using mashups or third-party applications) and where from (home, institution)
- number of messages, percentages which contain links/multimedia content, are addressed to other users or are resent, etc.

  Also, in near future we plan to examine closely various categories of educational microblogs and to interview their authors on the following directions:
- profile of the PLN members, what percentage belongs to educational, scientific domains
- how the type and relevancy of posted information / resources influence the network size
- which platforms are mostly used for research and why (patterns of adoption).

We also intend to collect case studies on using microblogging in research by actors in different academic positions. Thus, after formalizing them as scenarios in the Learning Design Group on Cirip, a guide of best practices could be obtained.

Completion period was extremely low, of only 10 days - maybe a longer period could lead to more relevant results.

This is the first study trying to show if and how Romanian academics use microblogging for teaching/research/personal development purposes and it is a part of our ongoing research about the impact of the use of social media by academics for scholarly activities. The survey of Romanian education professionals found that more than half of the 233 respondents who completed the survey in March 2011 use or intend to use microblogging platforms for research. The sample cannot be used to generalize the findings to the entire academics population (see lessons learned from above), but it can be a starting point for future studies. We firmly believe that microblogging can help to promote / support both teaching-learning process and research. The information sharing, professional interaction (discussions, collaboration, peer feedback, support and participation), visibility, recognition, public and community engagement transform scholarly communication in new and provocative ways.

10.4. Conclusions

This chapter presents two surveys that were operated in order to assess the opinions of students and teachers who have used the platform during courses and for professional/personal development.

The evaluation is part of the fourth DBR phase (Figure 2.3), the results being used for the platform refinement.

10.4.1. Contributions

The study on the usages, challenges and policies regarding the integration of microblogging in Romanian education, for teaching, learning and professional development is the original contribution of this chapter, being the first with this topic in the country. The results were published in (Grosseck and *Holotescu*, 2011).

Chapter 11. Conclusions and Future Work

In this thesis we have presented the design and implementation of an effective and innovative learning environment, based on the identified emerging technologies, trends and theories in education, which integrates social/informal learning in formal education.

The Cirip educational microblogging platform was developed using the Design Based Research (DBR) methodology approach.

We have presented two extended literature research on Emerging Educational Technologies and Microblogging, and their oportunities for Higher Education, proving that the topic of our work is part of an actual trend in research and education.

Also the results of two studies, illustrating how the Romanian educational actors integrate Emerging Educational Technologies and Microblogging in teaching/learning process, in research and in personal development. At this moment all these studies are unique in Romania.

Based on the findings, on a comparison of Social Media platforms starting from a set of functionalities and also on our extensive and long experience in working with and developing educational platforms, we have defined the requirements of the Cirip educational microblogging platform based on social objects, with many technical and educational innovations.

The design and architecture of the platform, together with its social mobile Learning Management system features were presented.

A large diversity of formal and informal learning Case Studies and the platform evaluation were the topics of the last chapters.

11.1. Original contributions

The original contributions of this thesis are presented in an extensive manner at the end of each chapter. Here a syntesis of the main contributions is exposed:

1. Identification and analysis of the emerging technologies, trends and theories in education, together with a proposed classification of Social Media platforms and applications. The findings are presented in Chapter 3 and were published in (Grosseck and *Holotescu*, 2011a).
2. An analysis of the features, uses and architectures of educational microblogging platforms was presented in Chapter 4 and published in (*Holotescu* and Crețu, 2013).
3. Two studies on the usages, challenges and policies regarding the integration of emerging technologies and microblogging in Romanian education, for teaching, learning and professional development. The results are published in Chapter 5 and 10. The studies were the first with this topic in Romania and were published in (*Holotescu* and Grosseck, 2012) and (Grosseck and *Holotescu*, 2011).
4. A conceptual model for Open Learning Environments founded on the identified educational technologies and theories was proposed in Chapter 3.
5. A model of Open Learning Environments based on microblogging technology was proposed in Chapter 6; some results were published in (*Holotesc*u and Crețu, 2013).
6. This model was validated through designing, implementing and evaluating the Cirip educational microblogging platform. The innovations brought by Cirip and presented in Chapter 8 and 9 are summarized below, together with the

corresponding articles:

- private and public groups can host online courses, having the characteristics of LMSs (*Holotescu* and Grosseck, 2009c; Grosseck and *Holotescu*, 2008);
- provides unique features for mobile learning (*Holotescu* and Grosseck, 2011; *Holotescu*, Crețu and Grosseck, 2014);
- integrates a large area of emerging educational technologies (Grosseck and Holotescu, 2010a);
- captures and formally represents the new pedagogical approaches and scenarios as learning design objects (*Holotescu* and Grosseck, 2010a);
- defines and implements instruments for learning analytics and for assessing students learning activities (*Holotescu*, Mioc and Grosseck, 2012; Grosseck and *Holotescu*, 2009);
- is used in formal and informal learning contexts (*Holotescu* and Grosseck, 2009c; Grosseck and *Holotescu*, 2010b; Grosseck and *Holotescu*, 2011c; *Holotescu* et al., 2012; *Holotescu* et al., 2013; *Holotescu* et al., 2014a).

11.2. Dissemination, recognitions and awards

The research of seven years focused on Social Media, Microblogging, emerging technologies and the doctoral program results were disseminated in:

- more than 60 articles: 25 articles are ISI Proceedings (16 are indexed by Thompson Reuters Web of Knowledge, while 9 are in course of indexing); also 5 articles are BDI indexed;
- 10 book chapters, presented in Annexes.

The platform has proved to be a viable solution for an open learning envronment integrating new technologies. This is demonstrated by:

1. the numerous number of courses, educational events and projects hosted on the platform: Cirip is the first microblogging platform that hosted an online course, in the summer of 2008 (Holotescu and Grosseck, 2009c); also is the first microblogging platform that has embedded multimedia objects and the only one with such a large area of objects, including Learning Design objects (Holotescu and Grosseck, 2010; Grosseck and Holotescu, 2010a);
2. an important number of users: over 125,000;
3. the positive evaluation realized by students and teachers who have used the platform during courses and for personal development, the results being the subject of the two studies presented in Chapter 10;
4. an important number of citations (over 600) of the articles we have published about the microblogging technology and Cirip, that demonstrate the validity of the platform and also the posibility to apply the findings/strategies in other different educational settings.

Other recognitions and awards are:

1. The educational features of Cirip were firstly presented in the article (Grosseck and Holotescu, 2008), being compared with those of Twitter. The article is considered one of the most important in Microblogging in Education area, having 260 citations;

2. The platform was presented at the First European Microblogging Conference in Hamburg, in 2009;
3. Cirip featured the Top 100 Tools for Learning 2009 (position 67) ;
4. Excellence prize at CNIV 2009, Iasi, for the article (Holotescu and Grosseck, 2009a);
5. Cirip was Finalist at Seedcamp Zagreb, January 2010;
6. Cirip was one of the 100 representative social networks worldwide analysed in the "CONSENT: Consumer sentiment regarding privacy on user generated content services in the digital economy" FP7 Project, 2012;
7. The Cirip platform was nominated by UNESCO Romania for "UNESCO King Hamad Bin Isa Al-Khalifa Prize for the Use of ICTs in Education" - April, 2012;
8. Cirip is listed as a representative project on the OER Knowledge Cloud portal, an initiative of the UNESCO/COL Chair in OER at Athabasca University and the UNESCO Chair in OER at the Open University of the Netherlands – since 2012;
9. The team having as members Prof.Dr.Ing.Vladimir-Ioan Creţu, Carmen Holotescu, Gabriela Grosseck and Cristian Armeana was nominated for the "Innovative Education Award", WCES 2013, for the research related to Cirip and Microblogging in education;
10. For its openness towards Open Educational Resources and Open Educational Practices, Cirip is listed on the Map of Open Education Initiatives created by the "POERUP - Policies for OER Uptake" European Project, 2014.

11.3. Future work

New features and case studies will be designed, implemented and tested in the next months on the Cirip platform:

1. Testing and consolidation of the MOOC features after designing and running a MOOC (Massive Open Online Course) related to „OER and MOOC";
2. Updating / enlarging the typology of social (multimedia) objects embedded on the platform - based on the platforms evolution/modifications and on the results of the Top 100 Tools for Learning 2014 (Hart, 2014);
3. A directory of (little) OERs (Open Educational Resources) (collaboratively) created on the networks connected with Cirip to be listed in user's profile;
4. Integrating the Learning Analytics for Cirip courses with existing institutional metrics and reporting mechanisms and standards (IMS Caliper - Learning Measurement Framework) in a joint project with a research team from Consiglio Nazionale delle Ricerche, Italy;
5. Improving user experience: new layout, make more transparent the embedding of social (multimedia) objects, lowering access time.

References

1. Adam, A. (2010). *Learning scenarios integration on a microblogging platform*. Diploma Thesis, coordinator Holotescu, C.
2. Agarwal, A. (2013). *Why massive open online courses (still) matter*. A TED presentation retrieved from http://www.ted.com/talks/anant_agarwal_why_massively_open_online_courses_still_matter.html.
3. Allen, J.P., Rosenbaum, H., Shachaf, P. 2007. *Web 2.0: A Social Informatics View*. In *Proceedings of the Thirteen Americas Conference on Information Systems, Keystone*, Retrieved from https://usffiles.usfca.edu/FacStaff/jpallen/public/we2_si-draft.pdf.
4. Alvarez-González, L. 2008. Learning Traces. In Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008. (pp. 2509-2516). Chesapeake, VA: AACE. Retrieved from http://www.editlib.org/p/28712.
5. Andersen, M. H. (2010). *To Share Or Not To Share: Is That The Question?* In *EDUCAUSE Review* vol. 45, no. 4 (July/August 2010): 40-49. Retrieved from http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume45/ToShareorNottoShareIsThattheQu/209321.
6. Anderson, D. (2009). *How has Web 2.0 reshaped the presidential campaign in the United States?* Proceedings of the WebSci'09: Society On-Line, 18-20 March 2009, Athens, Greece.
7. Anderson, T., & Dron, J. (2010). *Three generations of distance education pedagogy*. The International Review of Research in Open and Distance Learning, 12(3), 80-97. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/890/1826.
8. Andone, D. (2011). *Designing eLearning Spaces for Higher Education Students of the Digital Generation*. PhD Thesis, University Of Brighton, School of Computing, Engineering and Mathematics.
9. Andone, D., Vasiu, R. (2012). *Devising ICT in Engineering Education Based on the University Academia Expectations*. In ICALT (pp. 242-243).
10. Andone, D., Holotescu, C., Grosseck G. (2014). *Learning Communities in Smart Cities. Case Studies*. "DUBAI 2020: Smart City Learning" Workshop Proceedings, Nov, Dubai, United Arab Emirates. IEEE; *in course of publication*.
11. ASTD (2009). *Twitter As a Learning Tool. Really*. Retrieved from http://url.ie/197m.
12. Atkinson, C. (2009). *The Backchannel: How Audiences are Using Twitter and Social Media and Changing Presentations Forever*. New Riders Press.
13. Attwell, G. (2007). *e-portfolios – the DNA of the Personal Learning Environment*. Journal of e-Learning and Knowledege Society.
14. Attwell, G. (2010). *Working, learning and playing through Personal Learning Environments*. http://www.slideshare.net/GrahamAttwell/working-learning-and-playing-through-personal-learning-environments.
15. Attwell, G. (2011). *The Future of Social Media*. Retrieved from http://www.pontydysgu.org/2011/07/the-future-of-social-media/.
16. Augmented reality: A practical guide. (2008). Retrieved from http://media.pragprog.com /titles/cfar/intro.pdf.
17. Balcom Group. (2007). http://www.thebalcomgroup.com/node/124.
18. Barab, S. (2006). *Design-Based Research: A Methodological Toolkit for the*

Learning Scientist. In Sawyer, R. K. (Ed)., The Cambridge handbook of: The learning sciences, (pp. 153-169). New York, NY, US: Cambridge University Press, 2006.
19. Barab, S. & Squire, K. (2004). *Design-based research: putting a stake in the ground*. Journal of the Learning Sciences, 13(1), 1-14. Retrieved from http://learnlab.org/research/wiki/images/a/ab/2004_Barab_Squire.pdf.
20. Barnes, N.G., Lescault, A.M. 2011. *Social Media Adoption Soars as Higher-Ed Experiments and Reevaluates Its Use of New Communications Tools*, Center for Marketing Research. University of Massachusetts Dartmouth, North Dartmouth, MA. Retrieved from http://www.umassd.edu/cmr/studiesandresearch/socialmediaadoptionsoars/.
21. BECTA. (2009*). Software and internet analysis: Micro-blogging in education*. http://emergingtechnologies.becta.org.uk/index.php?section=etr&catcode=ETRE_0001&rid=14363.
22. Beliveau, L. et al. (2011). *New Possibilities for Teaching and Learning: Yammer*, wiki page retrieved from https://wiki.itap.purdue.edu/display/INSITE/Yammer#Yammer-YammerinEducationalSettings on March 1, 2012.
23. Bell, G. (2009). *Building Social Web Applications: Establishing Community at the Heart of Your Site*. O'Reilly Media, Incorporated.
24. Bennett, S., Bishop, A., Dalgarno, B., Waycott, J., & Kennedy, G. (2012). *Implementing Web 2.0 technologies in higher education: A collective case study*. Computers & Education, 59(2), 524-534.
25. Bernstein, M., Kairam, S., Suh, B., Hong, L. and Chi, E.H. (2010). *A Torrent of Tweets: Managing Information Overload in Online Social Streams*. In: *Proc. CHI 2010 Workshop on Microblogging*. Retrieved from http://www.parc.com/content/attachments/torrent-of-tweets.pdf.
26. Betta, C. (2007). *Social Networking and Academic Life*. Research Assignment. Literature Report. Delft University of Technology.
27. Billinghurst, M. (2002). *Augmented Reality in Education. New Horizons for Learning, December 2002*. Retrieved May 24, 2014 from http://www.newhorizons.org/ strategies/technology/billinghurst.htm.
28. Blake, B.P., N. Agarwal, R.T. Wigand, and J.D. Wood. (2010). *Twitter Quo Vadis: Is Twitter Bitter or Are Tweets Sweet?* Seventh International Conference on Information Technology ITNG 2010, 1257-1260 (2010).
29. Bonetta, L. (2009). *Should you be tweeting?.* Cell, 139(3), 452-453.
30. Bongio, A., Van Bruggen, J., Ceri, S., Cristea, V., Dolog, P., Hoffmann, A., & Zoni, L. (2006). *COOPER: towards a collaborative open environment of project-centred learning*. In Innovative Approaches for Learning and Knowledge Sharing (pp. 561-566). Springer Berlin Heidelberg. Retrieved from http://people.alari.ch/antonio/sites/default/files/cooper_poster_14_04_2006.pdf.
31. Borau, K., Ullrich, C., Feng, J. and Shen, R. (2009). *Microblogging for Language Learning: Using Twitter to Train Communicative and Cultural Competence in M. Spaniol et al.* (Eds.): *ICWL 2009*, LNCS 5686, pp. 78-87, 2009. Springer-Verlag Berlin Heidelberg.
32. Bradley, A. J. (January 7, 2010). *A new Definition of Social Media*. Retrieved from http://blogs.gartner.com/anthony_bradley/2010/01/07/a-new-definition-of-social-media/).
33. Bradwell, P. 2009. *The edgeless university. Why higher education must embrace technology*. Demos. UK.
34. Braz, L. M., Serrão, T., Pinto, S. C., & Clunie, G. (2012). *An architecture to*

foster the integration between Moodle and social networking sites. In Proceedings of the 6th Euro American Conference on Telematics and Information Systems (pp. 375-378). ACM.
35. Bruff, D. O., Fisher, D. H., McEwen, K. E., Smith, B. E. (2013). *Wrapping a MOOC: Student Perceptions of an Experiment in Blended Learning*. In Journal of Online Learning & Teaching, No 9(2). Retrieved from https://my.vanderbilt.edu/douglasfisher/files/2013/06/JOLTPaperFinal6-9-2013.pdf.
36. Bruff, D. (2012). *Teaching with MOOCs: Four Cases*. Retrieved from http://cft.vanderbilt.edu/2012/11/teaching-with-moocs-four-cases.
37. Bruns, A. (2007). *Beyond Difference: Reconfiguring Education for the User-Led Age*. Paper presented at ICE 3 (Ideas, Cyberspace, Education) Conference at Ross Priory, Loch Lomond, Scotland, 21-23 March 2007. Retrieved from http://produsage.org/files/Beyond%20Difference%20(ICE%203%202007).pdf.
38. Buchem, I. (2010). *Definitions of Personal Learning Environment (PLE)*. Presentation for PLE Conference in Barcelona, July 8-9 2010. http://www.slideshare.net/ibuchem/definitions-of-personal-learning-environment-ple-4029277?from=ss_embed.
39. Buchem, I., Camacho M. (2011). *M-project: first Steps to applying action research in designing a mobile learning course in higher education*. London Mobile Learning Group, pages: 123-135.
40. Burbeck, S. (1992). *Applications programming in smalltalk-80 (tm): How to use model-view-controller (mvc)*. Smalltalk-80 v2. 5. ParcPlace.
41. Burdett, J. (2003). *Making groups work: University students' perceptions*. In International Education Journal, No 4(3), Pages 177-191. Retrieved from http://openjournals.library.usyd.edu.au/index.php/IEJ/article/viewFile/6805/7445#page=33.
42. Burn, D. (2013). *Design Based Research and Agile Methodology*. Retrieved from http://soylentnetworks.blogspot.ro/2013/10/design-based-research-and-agile.html.
43. Burns, A., Eltham, B. (2009). *Twitter Free Iran: an Evaluation of Twitter's Role in Public Diplomacy and Information Operations in Iran's 2009 Election Crisis*. Communications Policy & Research Forum 2009, 19th-20th November 2009, University of Technology, Sydney.
44. Butcher, N., Kanwar, A., & Uvalić-Trumbić, S. (2011). *A basic guide to open educational resources (OER)*. Vancouver, Canada: Commonwealth of Learning, and Paris, France: UNESCO. Retrieved from http://www.col.org/oerBasicGuide.
45. Cameron, N. (2012). Why Twitter matters: Tomorrow's Knowledge Network. Retrieved from http://goo.gl/zGToj.
46. Campbell, A. (2010a). *Social media: a definition*. Amy Cambell's web log at Harvard Law. Retrieved from http://blogs.law.harvard.edu/amy/2010/01/21/social-media-%E2%80%94-a-definition/
47. Campbell, D. (2010b). *The new ecology of information: how the social media revolution challenges the university*. In *Environment and Planning EPD: Society and Space*, vol. 28(2), pp. 193–201, Retrieved from http://www.envplan.com/abstract.cgi?id=d2802ed.
48. Cann, A., Dimitriou, K., Hooley, T. (2011). *Social media – a guide for researchers*. Published by RIN. Retrieved from http://www.rin.ac.uk/our-work/communicating-and-disseminating-research/social-media-guide-researchers.
49. Cape Town Open Education Declaration: Unlocking the promise of open educational resources, Retrieved from, http://www.capetowndeclaration.org/read-the-declaration

50. Capterra (2012). *Top LMS Software Solutions*. Retrieved from http://blog.capterra.com/top-lms-software-solutions-infographic/.
51. Carr, A. (2010). *ZooBurst: Augmented Reality 3-D Pop-up Books for Students and Teachers*. Retrieved May 25, 2014 from http://www.fastcompany.com/1644265/zooburst-augmented-reality-3-d-pop-up-books-for-students-andteachers.
52. Casquero, O., Portillo, J., Ovelar, R., Benito, M., & Romo, J. (2010*). iPLE Network: an integrated eLearning 2.0 architecture from a university's perspective*. Interactive Learning Environments, 18(3), 293-308.
53. Caufield, M. (2013a). *Introducing the Distributed Flip*. Retrieved from http://hapgood.us/2013/04/11/introducing-the-distributed-flip/.
54. Caufield, M. (2013b). *The Distributed Flip (Presentation for InstructureCon 2013).* Retrieved from http://hapgood.us/2013/06/26/the-distributed-flip-presentation-for-instructurecon-2013/.
55. Caufield, M., Collier, A., Halawa, S. (2013). *Rethinking Online Community in MOOCs Used for Blended Learning*. In EDUCAUSE Review Online. Retrieved from http://www.educause.edu/ero/article/rethinking-online-community-moocs-used-blended-learning.
56. CDE, Center for Digital Education (2008): *A Connected life. A look at mobile strategies for schools, colleges and universities*. e.Republic.
57. Ceuca, R. (2009). *Yammer dupa jumatate de an.* Retrieved from http://blog.raduceuca.com/2009/03/09/yammer-dupa-jumatate-de-an.
58. Chang, L., Lerner, R., McGrath, M., Nutt, M. & Smith, K. (2010). *What are we doing? A Study of Collaborative Storytelling Through Twitter.* Retrieved from http://goo.gl/QMlgP.
59. Cheong, M., & Ray, S. (2011). *A Literature Review of Recent Microblogging Developments.* Technical Report TR-2011-263, Clayton School of Information Technology, Monash University.
60. Chew, C., Eysenbach, G., 2010. *Pandemics in the Age of Twitter: Content Analysis of Tweets during the 2009 H1N1 Outbreak*. PLoS ONE 5(11): e14118, doi:10.1371/journal.pone.0014118.
61. Chickering, A. W., Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. In *AAHE Bulletin*, 3–7.
62. Cho, B. (2009). Micro Blog Architecture. Retrieved from http://javamaster.wordpress.com/category/enterprise-2-0/micro-blog-enterprise-2-0/.
63. Churches, A. (2009). *Bloom's Digital Taxonomy*. Retrieved from http://edorigami.wikispaces.com/Bloom's+Digital+Taxonomy.
64. CIBER (2010). *Social media and research workflow*. University College London and Emerald Group Publishing Ltd. Retrieved from http://www.ucl.ac.uk/infostudies/research/ciber/social-media-report.pdf.
65. Clough, G., Jones, A., McAndrew, P., & Scanlon, E. (2008). Informal learning with PDAs and smartphones. Journal of Computer Assisted Learning, 24(5), 359–371.
66. Cogdill, S., Kilborn, J., Fanderclai, T.L. & Williams, M.G. (2001). Backchannel whispering in digital conversations. In Proceeding of the 34th Hawaii International Conference on System Sciences (HICSS 2001). IEEE Press. Available from http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=926500 (accessed on 18th August 2010).
67. Cohen, G. (2012). Effective Content Curation in Higher Ed. Retrieved from http://goo.gl/G01Vb.

68. Coles, T. (2011). 35 ways to use Twiducate for deeper learning. Retrieved from http://taitcoles.wordpress.com/2011/01/23/35-ways-to-use-twiducate-for-deeper-learning/.
69. Collins, E., Hide, B. (2010). *Use and relevance of Web 2.0 resources for researchers*. In Publishing in the Networked World: Transforming the Nature of Communication 14th International Conference on Electronic Publishing (pp. 271-289). Retrieved from http://dhanken.shh.fi/dspace/bitstream/10227/599/20/19collins_hide.pdf.
70. Colvin, S. (2011). *What is the state of social media in higher education?*, blog post retrieved from http://uv-net.uio.no/wpmu/hedda/2011/07/15/what-is-the-state-of-social-media-in-higher-education/.
71. Conole, G. (2010). *Learning design–Making practice explicit*. Retrieved from http://oro.open.ac.uk/21864/.
72. Conole, G. (2013). *Designing for learning in an open world* (Vol. 4). Springer. Retrieved from http://cloudworks.ac.uk/cloudscape/view/2155.
73. Conole, G. (2014). *The Use of Technology in Distance Education*. In Online Distance Education. Towards a Research Agenda. AU Press, 2014.
74. Conole, G., & Alevizou, P. (2010). *A literature review of the use of Web 2.0 tools in Higher Education*. Retrieved from http://tinyurl.com/33ujhfa.
75. Conole, G., & Culver, J. (2009*). Cloudworks: Social networking for learning design*. Ascilite Conference - http://www.ascilite.org.au/conferences/melbourne08/procs/conole.pdf.
76. Conole, G., & Culver, J. (2010). *The design of Cloudworks: Applying social networking practice to foster the exchange of learning and teaching ideas and designs*. Computers & Education, 54(3), 679-692.
77. Cool, H. (2010). *Content Curation: Learning from others and sharing their knowledge.* Retrieved from http://goo.gl/cXsWv.
78. Costa, C. (2010). *Social media for researchers*. Retrieved from http://www.slideshare.net/cristinacost/social-media-for-researchers-5591131#.
79. Costa, C. (2011). *The Twitterati … Workshop on Twitter for Researchers*. Retrieved from http://virtual-doc.salford.ac.uk/pgrs/2011/02/25/the-twitterati/.
80. Costa, C., Beham, G., Reinhardt, W., & Sillaots, M. (2008). Microblogging in technology enhanced learning: A use-case inspection of PPE summer school 2008. Retrieved September 30, 2009 from http://togather.eu/handle/123456789/365
81. Couros, A. (2010). *Developing Personal Learning Networks for Open and Social Learning*. http://www.aupress.ca/books/120177/ebook/06_Veletsianos_2010-Emerging_Technologies_in_Distance_Education.pdf.
82. Creed-Dikeogu, G. & Clark, C. (2013). Are You MOOC-ing Yet? A Review for Academic Libraries. *Kansas Library Association College And University Libraries Section Proceedings, 3*, 9-13. doi:10.4148/culs.v1i0.1830.
83. Crețu, V. (2010). *Software Project Management*. Lecture Notes. Retrieved from http://cv.upt.ro.
84. Cross, J. (2004). *An informal history of eLearning*. Horizon, 12(3), 103-110. Retrieved from http://internettime.com/Learning/articles/xAn%20Informal%20History%20of%20eLearning.pdf.
85. Cross, S. & Galley, R. (2013). *The OLDS MOOC Evaluation Plan and an Experiment in Recognising Learning using Badges*. Presentation at http://www.slideshare.net/sjc36/e-lc-eventscslides8.

86. Cross, S., Conole, G. (January 2009). *Learn About Learning Design*. Institute of Educational Technology, The Open University (UK). Retrieved from http://ouldi.open.ac.uk/Learn%20about%20learning%20design.pdf.
87. Crosslin, M. (2010). *Social Learning Environment Manifesto*. Retrieved from http://www.edugeekjournal.com/2010/03/18/social-learning-environment-manifesto/.
88. Crosslin, M. (2014). *#DALMOOC Overview*. Online at https://linkresearchlab.org/dalmooc/overview/.
89. Dahrendorf, D. (2010): Building Open Learning Environments with OpenSocial. Available at http://tinyurl.com/3luu5oz.
90. Dennis, M. (2012). *The impact of MOOCs in Higher Education*, College and University, v88 n2 pp. 24-30.
91. Digital Curation Center (2012), *What is digital curation?* Retrieved from http://goo.gl/ynW5Q.
92. Digital Daya. (2012). World Leaders on Twitter, Ranking Report. Retrieved from http://www.digitaldaya.com/admin/modulos/galeria/pdfs/69/156_biqz7730.pdf.
93. Digital Future Report. (2009). http://www.digitalcenter.org.
94. Downes, S. (2008)*. Places to go: Connectivism & connective knowledge. Innovate, 5(1), 6.*
95. Downes, S. (2010). *Pedagogical Foundations For Personal Learning*. Retrieved from http://www.slideshare.net/Downes/pedagogical-foundations-for-personal-learning.
96. Downes, S. (2012a). *OER Minicourse*. Retrieved from http://www.slideshare.net/Downes/oer-minicourse.
97. Downes, S. (2012b). *Connectivism and Connective Knowledge*. Ebook at http://www.downes.ca/files/books/Connective_Knowledge-19May2012.pdf.
98. Downes, S. (2011). *Open Educational Resources: A definition*. Blog post retrieved from http://halfanhour.blogspot.com/2011/07/open-educational-resources-definition.html.
99. Downes, S. (2005). Elearning 2.0, *eLearn Magazine*, blog post retrieved from http://www.elearnmag.org/subpage.cfm?section=articles&article=29-1.
100. Downes, S. et al. (2011). *The MOOC Guide*. Retrieved from https://sites.google.com/site/themoocguide.
101. Doyle, C. (2010). *A literature review on the topic of social media*, file retrieved from blog post, http://cathaldoyle.com/wp-content/uploads/2010/10/Literature-Review-of-Social-Media.doc.
102. Dron, J., & Anderson, T. (2014). *Teaching crowds: Social media and distance learning*. AU Press, Athabasca University. Retrieved from http://www.aupress.ca/index.php/books/120235.
103. Du, H., Rosson, M., Carroll, J. M., and Ganoe, C. 2009. I felt like a contributing member of the class: increasing class participation with classcommons. In Proceedings of the ACM 2009 international Conference on Supporting Group Work (Sanibel Island, Florida, USA, May 10 - 13, 2009). GROUP '09. ACM, New York, NY, 233-242.
104. Du, H., Rosson, M., Carroll, J. M., & Ganoe, C. (2009). I felt like a contributing member of the class: increasing class participation with classcommons. In *Proceedings of the ACM 2009 international Conference on Supporting Group Work* (Sanibel Island, Florida, USA, May 10 - 13, 2009). GROUP '09. ACM, New York, NY, 233-242.
105. Ducu, C. (2010). Utilizarea noilor tehnologii in educatie. Raport *Scoala de vara „Educatia merita!"*, Fundatia Dinu Patriciu. Retrieved from http://www.scoaladevara.eu.

106. Duh, K., Hirao, T., Kimura, A., Ishiguro, K., Iwata, T., & Yeung, C. M. A. (2012). *Creating Stories: Social Curation of Twitter Messages*. Retrieved from http://goo.gl/x3qlD.
107. Dumitru, M. (2009). Campania electorală în era Internetului. Sfera Politicii 143. pp. 67-73.
108. Dunlap, J.C., Lowhenthal, P.R. (2009). *Instructional Uses of Twitter*. Chapter 8 in *CU Online HandBook.Teach differently. Create and Collaborate*, Edited by Patrick R. Lowenthal, David Thomas, Anna Thai, BrianYuhnke, University of Colorado Denver.
109. Dunleavy, M., Dede, C., & Mitchell, R. (2009). *Affordances and limitations of immersive participatory augmented reality simulations for teaching and learning*. Journal of Science Education and Technology, 18(1), pp. 7-22.
110. Dwyer, P. (2012). Are DJs curators? Retrieved from http://goo.gl/1EnWN.
111. Ebner, M. & Maurer, H. (2008). *Can Microblogs and Weblogs change traditional scientific writing?*. Proceedings of e-learn 2008, Las Vegas, p. 768-776.
112. Ebner, M. & Reinhardt, W. (2009). *Social networking in scientific conferences – Twitter as tool for strengthen a scientific community*. Science 2.0 Workshop / ECTEL Conference / Nizza.
113. Ebner, M. (2009). *Interactive Lecturing by Integrating Mobile Devices and Micro-blogging in Higher Education*. Journal of Computing and Information Technology - CIT 17, 2009, 4, 371–381, doi:10.2498/cit.1001382.
114. Ebner, M., Lienhardt, C., Rohs, M. and Meyer, I. (2010). *Microblogs in higher education—A chance to facilitate informal and process oriented learning?* In *Computers & Education*, 55:92–100.
115. Ebner, M., Mühlburger, H., Schaffert, S., Schiefner, M., Reinhardt, W., Wheeler, S. (2010). *Getting Granular on Twitter Tweets from a Conference and their Limited Usefulness for Non-Participants*. Proceedings of the WCC 2010 conference (track "Key Competencies in the Knowledge Society"). http://www.wcc2010.org.
116. Ebner, M., Schiefner, M. (2008). *Microblogging - more than fun?* Proceedings of IADIS Mobile Learning Conference 2008, Inmaculada Arnedillo Sánchez and Pedro Isaías ed., Portugal, 2008, p. 155-159.
117. EC. (2012). *European Commission: Education and training, Rethinking Education strategy*. Retrieved from http://europa.eu/rapid/press-release_IP-12-1233_en.htm.
118. Efron, M. and Winget, M. (2010). *Questions are Content: A Taxonomy of Questions in a Microblogging Environment*. Paper presented at ASIST 2010, October 22–27, 2010, Pittsburgh, PA, USA.
119. Elch. O. (2010). *Twiter as a PLN*. http://whatsnewintheworld.net/2010/01/Twitter-as-a-pln/.
120. Engeström, J. (2005). *Microblogging: Tiny social objects. On the future of participatory media*. http://www.slideshare.net/rashmi/jyri-engestrom-social-objects.
121. Engeström, J. (2005). *Why some social network services work and others don't - Or: the case for object-centered sociality*. Retrieved from Zengestrom http://www.zengestrom.com/blog/2005/04/why-some-social-network-services-work-and-others-dont-or-the-case-for-object-centered-sociality.html.
122. Engeström, J. (2009). *Building Sites Around Social Objects.* Retrieved from http://www.slideshare.net/jyri/building-sites-around-social-objects-web-20-expo-sf-2009.
123. European Commission. (2000*). e-Learning-Designing tomorrow's education*. Commission of the European Commission. Retrieved from

http://europa.eu/legislation_summaries/education_training_youth/lifelong_learning/c11046_en.htm.
124. Faculty Focus (2011). *Social Media Usage Trends Among Higher Education Faculty*. Special Report. A Magna Publication, http://www.facultyfocus.com/wp-content/uploads/images/2011-social-media-report.pdf.
125. Faculty Focus, Special Report. (2010). *Twitter in Higher Education 2010: Usage Habits and Trends of Today's College Faculty*. Magna Publication.
126. Faimon, P., Platt, G. (2010). *Universities in the "Free" Era*. Presentation at Conference SXSW Interactive 2010, slides available at http://www.slideshare.net/glenn.platt/universities-in-the-free-era-sxsw-2010-presentation.
127. Faltin, N., Dahrendorf, D., Ternis, J. T. (2013). *Responsive Open Learning Environments*. Retrieved from http://www.role-project.eu/wp-content/uploads-role/2009/02/role-deliverable-9.4.pdf.
128. Feijóo, C., Pascu, C., Misuraca, G. and Lusoli W. (2009): *The Next Paradigm Shift in the Mobile Ecosystem: Mobile Social Computing and the Increasing Relevance of Users*. In *Communications & Strategies*, no. 75, 3rd quarter, 57-77, 2009.
129. Ferraro, R. (2010). *Articulated Naturality (AN) vs Augmented Reality (AR) - the new frontier of Mobile 2.0*. Retrieved from http://mobverge.blogspot.com/2010/09/articulated-naturality-vs-augmented.html#links.
130. Fielding, R. (2000*). Architectural styles and the design of network-based software architectures*. PhD thesis, University of California. Retrieved from http://www.ics.uci.edu/~fielding/pubs/dissertation/rest_arch_style.htm.
131. Fini, A. (2009). The Technological Dimension of a Massive Open Online Course: The Case of the CCK08 Course Tools. *The International Review Of Research In Open And Distance Learning*, 10(5).
132. Freire, J. & Brunet, K.S. (2010). Políticas y prácticas para la construcción de una Universidad Digital. In *La Cuestión Universitaria*, vol. 6, pp. 85-94, Retrieved from http://www.lacuestionuniversitaria.upm.es/web/grafica/articulos/imgs_boletin_6/pdfs/LCU-6-7.pdf.
133. Friesen, N. (2013). Learning Analytics: Readiness and Rewards. Canadian Journal of Learning and Technology. Retrieved from http://scholarworks.boisestate.edu/edtech_facpubs/95/.
134. Gable, S.A. (2010): Anatomy of an eLearning Lesson: Nine Events of Instruction. Blog post retrieved from http://tinyurl.com/3zvz3ce (June 24, 2010).
135. Gaebel, M. (2013). *MOOCs: Massive Open Online Courses*. EUA occasional papers, European University Association, Brussels, http://www.eua.be/Libraries/Publication/EUA_Occasional_papers_MOOCs.sflb.ashx.
136. Gagnon, D.J. (2010). Mobile Learning Environments, Educause Quarterly, Vol 33, No 3. http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/MobileLearningEnvironments/213690.
137. García, M.R., Rey, I.G., Ferreira, P.B., Puerto, G.D. (2009). *University 2.0: How well are teachers and students prepared for Web 2.0 best practices?* In Proceedings Book of the m-ICTE2009 Conference: *Research, Reflections and Innovations in Integrating ICT in Education*, pp. 1126-1130, Retrieved from http://www.formatex.org/micte2009/book/1126-1130.pdf.
138. Gavan, P.L. Watson (2011). *Micro-Blogging and the Higher Education Classroom: Approaches and Considerations*. In Charles Wankel (ed.) Teaching

Arts and Science with the New Social Media (Cutting-edge Technologies in Higher Education, Volume 3, Emerald Group Publishing Limited, pp.365-383
139. Geser, G. (ed.) (2007). *Open Educational Practices and Resources*. *OLCOS Roadmap 2012*. Retrieved from http://www.olcos.org/cms/upload/docs/olcos_roadmap.pdf.
140. Giacomantonio, L. (2011). *20 Ways to Use Edmodo*. Retrieved from http://www.slideshare.net/seyfert6/20-ways-to-use-edmodo.
141. Gil, E. (2012). *How Pinterest Will Transform the Web in 2012: Social Content Curation As The Next Big Thing*. Retrieved from http://goo.gl/kl4gS.
142. Gilpin, D. (2010). *Working the Twittersphere: Microblogging as professional identity construction*. In Z. Papacharissi (Ed.). *The Networked Self: Identity, Community and Culture on Social Network Sites*. New York: Routledge, http://asu.academia.edu/DawnGilpin/Papers/120301/Working_the_Twittersphere_Microblogging_as_professional_identity_construction.
143. Glance, D. G., Forsey, M., Riley, M. (2013). *The pedagogical foundations of massive open online courses*. In First Monday No 18(5). Retrieved from http://firstmonday.org/ojs/index.php/fm/article/view/4350/3673.
144. Good, R. (2010). *Real-Time News Curation* - The Complete Guide Part 5: The Curator Attributes And Skills. Retrieved from http://goo.gl/TKp7j.
145. Good, R. (2012): http://curation.masternewmedia.org/.
146. Gray, K., Thompson, C., Sheard, J., Clerehan, R., Hamilton, M.(2010a). *Students as Web 2.0 authors: Implications for assessment design and conduct.* Australasian Journal of Educational Technology. 26(1), 105-122, 2010.
147. Gray, K.., Waycott, J., Clerehan, R., Hamilton, M., Richardson, M., Sheard, J., Thompson, C. (2010b). *Web 2.0 authoring tools in higher education learning and teaching: New directions for assessment and academic integrity*. A framework for field-testing and refining good practice guidelines in pilot projects at Australian universities during Semester One 2010.
148. Greenhow, C., Robella, B., Hughes, J. E. (2009). *Learning, teaching, and scholar-ship in a digital age: Web 2.0 and class-room research: What path should we take now?* In Educational Researcher 2009; 28: 246.
149. Groom, J. & Lamb, B. (2014). *Reclaiming Innovation*. EDUCAUSE Review, May/June 2014, vol. 49, no. 3.
150. Grosseck, G. (2009a). *This is not letter C*. Retrieved from http://www.slideshare.net/ggrosseck/this-is-not-letter-c.
151. Grosseck, G. (2009b). *To use or not to use Web 2.0 in Higher Education*. In *Procedia – Social and Behavioral Sciences New Trends and Issues in Educational Sciences*, vol. 1, issue 1, pp. 478-482, Elsevier.
152. Grosseck, G., Bran, R., & Tiru, L. (2011). *Dear teacher, what should I write on my wall? A case study on academic uses of Facebook*. Procedia-Social and Behavioral Sciences, 15, 1425-1430.
153. Grosseck, G., & Holotescu, C. (2008). *Can we use twitter for educational activities?* Paper presented at the *4th International Scientific Conference eLearning and Software for Education*, April 17-18, 2008.Bucharest, Romania.
154. Grosseck, G., & Holotescu, C. (2009). *Indicators for the analysis of learning and practice communities from the perspective of microblogging as a provocative sociolect in virtual space*. 5th International Scientific Conference eLSE – eLearning and Software for Education, Bucharest, 9-10 April 2009.
155. Grosseck, G., & Holotescu, C. (2010a). *Microblogging multimedia-based teaching methods best practices with Cirip.eu*. In *Procedia - Social and Behavioral Sciences*, Volume 2, Issue 2 2010: 2151-2155. WCES 2010

Conference: Innovation and Creativity in Education. Istanbul, 4-8 February 2010.
156. Grosseck, G. & Holotescu, C. (2010b). *Learning from the Stream. An "M" Case Study: M for microblogging, m(y)-conference/m(y)-event,and micro/m(y)-learning*. ICVL 2010, The 5th International Conference on Virtual Learning. Retrieved from http://goo.gl/LWxqb.
157. Grosseck, G., Holotescu, C. (2011a). *Social media challenges for Academia*. In *Contemporary Issues in Education and Social Communication. Challenges for Education, Social Work and Organizational Communication* / Bogdan Pătruț, Liliana Mâță, Ioan-Lucian Popa (eds.). München, AVM – Akademische Verlagsgemeinschaft München, pp. 148-174.
158. Grosseck, G., Holotescu, C. (2011b). *Academic research in 140 characters or less*. The 7th International Scientifiv Conference „eLearning and Software for Education", Bucharest, April 28-29 2011. Retrieved from http://adlunap.ro/eLSE_publications/papers/2011/1590_1.pdf.
159. Grosseck G., & Holotescu C. (2013a). *Scholarly Digital Curation in 140 Characters*. In "Applied Social Sciences: Education Sciences". Book printed by Cambridge Scholars Publishing http://www.amazon.de/Applied-Social-Sciences-Education/dp/144384246X
160. Guțu, D. (2007). New Media, Tritonic Publishing House, Bucharest.
161. Haggard, S. (2013). *The Maturing of the MOOC*. Department for Business, Innovation and Skills, London, 2013. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/240193/13-1173-maturing-of-the-mooc.pdf.
162. Hall, R. (2010). Connecting Transitions and Independent Learning: an evaluation of read-write web approaches (CoTIL), Retrieved from http://evidencenet.pbworks.com/w/page/19383478/Connecting%20Transitions%20and%20Independent%20Learning%3A%20an%20evaluation%20of%20read-write%20web%20approaches%20(CoTIL).
163. Hamid, S., Chang, S. and Kurnia, S. (2010). *Investigation of the Use and Benefits of Online Social Networking (OSN) in higher education*. The 8th Education and Information Systems, Technologies and Applications: EISTA 2010, 29 June – 2 July 2010. Orlando, Florida. http://tinyurl.com/3vfxnp2.
164. Hamilton, K. (2011). *Augmented Reality in Education Wiki*. Retrieved from http://wik.ed.uiuc.edu/index.php/Augmented_Reality_in_Education.
165. Hargadon, S. (31 July 2011). „Teacher 2.0 by Steve Hargadon #rscon3 @stevehargadon", blog post retrieved from http://mrlaulearning.blogspot.com/2011/07/teacher-20-by-steve-hargadon-rscon3.html
166. Harris, A., Rea, A. 2009. Web 2.0 and Virtual World Technologies: A Growing Impact on IS Education. *Journal of Information Systems Education*, 20 (2), pp. 137-144.
167. Harry, D., Green, J., Donath, J. (2009). *backchan.nl: Integrating Backchannels in Physical Space*. CHI 2009, April 4–9, 2009, Boston, MA, USA.
168. Hart, J. (2009). *C4LPT Guide to Social Learning*. http://janeknight.typepad.com/pick/2009/11/c4lpt-guide-to-social-learning.html.
169. Hart, J. (2010). *Using Twitter in a face-to face workshop*. Retrieved from http://janeknight.typepad.com/socialmedia/2010/05/using-twitter-in-a-facetoface-workshop.html.
170. Hart, J. (2011). *Social Learning Handbook*. Retrieved from http://sociallearningcentre.co.uk/activities/how-to-use-twitter-for-social-learning/.

171. Hart J. (2007-2014). *Tops 100 Tools for Learning.* Retrieved from http://c4lpt.co.uk/top100tools.
172. Hart, J. (2014). *Social or Fauxial Learning?* Retrieved from http://www.c4lpt.co.uk/blog/2014/10/19/social-learning-or-fauxial-learning/.
173. Hartman, J.L., Dziuban, C. & Brophy-Ellison, J. (2007). *Faculty 2.0*. In *EDUCAUSE* Review, vol. 42, no. 5, September / Octover 2007, pp. 62-77.
174. Head, A. & Eisenberg, M. (2009). *How College Students Seek Information in the Digital Age*. Project Information Literacy Progress Report: „Lessons Learned", The Information School, University Of Washington.
175. Heo, H., Jo, I., Lim, K. Y., Lee, H. W., & Suh, S. (2013). *The convergence of informal learning and formal education in a ubiquitous environment*. In Luckin, R., Puntambekar, S., Goodyear, P., Grabowski, B. L., Underwood, J., & Winters, N. (Eds.). (2013). *Handbook of Design in Educational Technology*. Routledge.
176. Henrysson, A. & Ollila, M. (2004). *Umar- ubiquitous mobile augmented reality*. ACM.
177. Herrington, J., A. Herrington, J. Montei, I. Olney, and B. Ferry. (2009). *Using mobile technologies to develop news ways of teaching and learning*. New technologies, new pedagogies: Mobile learning in higher education, Faculty of Education, University of Wollongong, 2009, 138p, retrieved from http://ro.uow.edu.au/eduppers/75.
178. Herrington, J., McKenney, S., Reeves, T., & Oliver, R. (2007). *Design-based research and doctoral students: Guidelines for preparing a dissertation proposal*. Retrieved from http://ro.ecu.edu.au/cgi/viewcontent.cgi?article=2611&context=ecuworks.
179. Hill, P. (2012). *Online Educational Delivery Models: A Descriptive View*. In Educause Review, No 47(6), Pages 84-86. Retrieved from http://www.educause.edu/ir/library/pdf/ERM1263.pdf.
180. Hill, P. (2013). *The Most Thorough Summary (to date) of MOOC Completion Rates*. *E-Literate Blog*. Retrived from http://mfeldstein.com/the-most-thorough-summary-to-date-of-mooc-completion-rates/.
181. Hill, P. (2014). *Opening Up the LMS Walled Garden*. e-Literate Blog. Retrieved from http://mfeldstein.com/opening-lms-walled-garden.
182. Hocoy, D. (2013). *Facebook as Learning Management System: The Good, the Bad, and the Unexpected. Educause Review*. Retrieved from http://www.educause.edu/ero/article/facebook-learning-management-system-good-bad-and-unexpected.
183. Holland, C., Muilenburg, L. (2011). *Supporting Student Collaboration: Edmodo in the Classroom*. In M. Koehler & P. Mishra (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference* 2011 (pp. 3232-3236). Chesapeake, VA: AACE. Retrieved from http://www.editlib.org/p/36816.
184. Holotescu, C. (2004a). *Flickr in education*. Retrieved from http://www.timsoft.ro/weblog/index.php?blog=1&title=flickr_in_educatie_invitatie_1.
185. Holotescu, C. (2004b). *Ghid eLearning*. Solness, Timisoara.
186. Holotescu, C. (2005). *Using blogs in education*. Retrieved from http://www.timsoft.ro/weblog/index.php?title=utilizarea_weblogurilor_in_educatie_invi.
187. Holotescu, C. (2007). *Open educational resources and FLOSS*. Presentation at eLiberatica, Brasov, May 2007. Retrieved from http://www.slideshare.net/cami13/oer-and-floss.

188. Holotescu, C. (2012, updated 2014). *OER in Romania*. Report in POERUP Project: Policies for OER Uptake. Retrieved from http://poerup.referata.com/wiki/Romania.
189. Holotescu, C. (2013). *PhD Report 1: Social Media in Romanian Higher Education. Features, Uses and Arhitectures of Educational Microblogging Platform*. UPT, Jan 14, 2013, retrieved from http://cs.upt.ro/~cami.
190. Holotescu, C., & Crețu, V. (2013). *Microblogging Platforms in Education: Features, Usages and Architectures*. Chapter in the book "Microblogging in Educational Settings. How Microblogging Platforms Can Be Used in Formal and Informal Education", AVM Akademische Verlagsgemeinschaft München 2013. Editors Carmen Holotescu, Gabriela Grosseck, Antonio Calvani, Filippo Bruni.
191. Holotescu, C., & Grosseck, G. (2007). *RSS and Blogs in Education*. OBELFA online course. Retrieved from http://www.timsoft.ro/space5/.
192. Holotescu, C., & Grosseck, G. (2009a). *Cirip.eu: Building Learning Communities on Microblogging Platforms*. CNIV 2009, Iasi.
193. Holotescu, C. & Grosseck, G. (2009b). *Using Microblogging For Collaborative Learning*. In „New Technology Platforms for Learning – Revisited. LOGOS Open Conference on strengthening the integration of ICTresearch effort", 19-20 ian. 2009 Budapesta,Ungaria, ISBN 978-963-87914-1-2, EDEN – European Distance and E-learning Network, pag. 71-80.
194. Holotescu, C., & Grosseck, G. (2009c). *Using microblogging to deliver online courses. Case-study: Cirip.ro.* Procedia-Social and Behavioral Sciences, New Trends and Issues in Educational Sciences, Edited by Huseyin Uzunboylu and Nadire Cavus, 91(1), pp. 495-501, Elsevier.
195. Holotescu, C. & Grosseck, G. (2010a). *Learning to microblog and microblogging to learn. A case study on learning scenarios in a microblogging context*. The 6th International Scientific Conference eLearning and Software for Education Bucharest, April 15-16. 2010.
196. Holotescu, C., Grosseck, G. (2011a): *M3-learning - Exploring mobile multimedia microblogging learning*. *World Journal on Educational Technology*, 2011, Vol. 3(3):168-176.
197. Holotescu, C., Grosseck, G. (2011b). *Cirip.Eu – An educational microblogging platform around objects 2.0*. *Form@re Open Journal*, Italy, n.74 Febr/March, 2011.
198. Holotescu, C., & Grosseck, G. (2011c). *Mobile learning through microblogging*. Procedia – Social and Behavioral Sciences, Volume 15, 2011, Pages 4-8, 3rd World Conference on Educational Sciences – 2011 (WCES 2011) (ISI Proceedings).
199. Holotescu, C., & Grosseck, G. (2012a). *An empirical analysis of the educational effects of Social Media in universities and colleges*. In Conference Proceedings of "eLearning and Software for Education" eLSE 2012 (No. 01, p. 167).
200. Holotescu, C. , Grosseck, G. (2013a). *Cirip.eu – An Educational Mobile Multimedia Microblogging Platform.* In book "Microblogging in Educational Settings. How Microblogging Platforms can be used in Formal and Informal Education", editors: Carmen Holotescu, Gabriela Grosseck, Antonio Calvani, Filippo Bruni; AVM – Akademische Verlagsgemeinschaft München 2013 © Thomas Martin Verlagsgesellschaft, München, ISBN: 978-3-86924-498-3.
201. Holotescu, C., Grosseck, G., Crețu, V. (2013). *MOOC's Anatomy. Microblogging as the MOOC's Control Center*. The 9th eLearning and Software for Education Conference - eLSE 2013, Bucharest, April 25-26.

202. Holotescu, C., Grosseck, G., Crețu, V., Naaji, A. (2014a). *Integrating MOOCs in Blended Courses*. 10th International Scientific Conference eLearning and Software for Education, Bucharest, Romania, ISSN 2066 - 026X.
203. Holotescu, C., Grosseck, G., Crețu, V., Danciu, E. (2014b). *The power of the three words and one acronym: OER vs OER. Subtitle: I'm not an Ogre of the Enchanted Realm (of cyberspace). I'm an Omnipresent Educational Rescuer (because I use the OER!).* 6th World Conference on Educational Sciences (WCES), Malta, Procedia - Social and Behavioral Sciences Elsevier ScienceDirect, ISSN 1877-0428.
204. Holotescu, C., Karagianni, C.N., Papadakis, S., Grosseck, G. (2007). *A Methodology For Developing Blended Courses Integrated With Web 2.0 Technologies*. 8th European Conference E-COMM-LINE 2007, 20-22 sept., IPA Publishing House Bucureşti.
205. Holotescu, C., & Knight, J. (2002a). *Online Communities - eWorkshop Notes*. eLearning eJournal.
206. Holotescu, C., & Knight, J. (2002b). *Methodologies in e-Learning - eWorkshop Notes*. eLearning eJournal.
207. Holotescu, C., & Naaji, A. (2007). *Tehnologii Web*. Vasile Goldis University Press, Arad, 2007.
208. Holotescu, C., & Tella, S. (2007). *Web2.0 and OER in education*, KEP blended course. Knowledge Economy Project "Development of Education Policy Concerning the Integration of Information Technology and Communications in the Pre-University Romanian Education System".
209. Hughes, J. (2011). *Evaluation 2.0*. Retrieved from http://www.slideshare.net/GrahamAttwell/evaluation-20-8754478?from=ss_embed
210. Hurme, T. (2009). Online Campaign Strategy, Web 2.0 tools, and voter preference in the 2008 U.S. Presidential Election. CEU Political Science Journal (CEU Political Science Journal), issue: 04 / 2009, pages: 566-606.
211. IMS Caliper. (2013). *Learning Measurement for Analytics Whitepaper*. Retrieved from http://www.imsglobal.org/IMSLearningAnalyticsWP.pdf.
212. Ingerman, B. L., & Yang, C. (2010). *Top-Ten IT Issues, 2010*. Educause Review, 45(3), 46-60.
213. Ingram, M. (2012). *Twitter Acquisition Confirms Curation Is the Future*. Retrieved from http://goo.gl/MhIEr.
214. Internet Usage in Europe (2009). Retrieved from http://www.internetworldstats.com/stats4.htm#europe.
215. Ioan, P. (1995). *Educaţie şi creaţie. În perspectiva unei logici "situaţionale"*. Editura Didactică şi Pedagogică. Bucureşti.
216. ITU Internet Reports (2005). *The Internet of Things*. Retrieved from http://www.cahk.hk/Event/30/30.asp.
217. Ivanova, M. (2009a). *Use Of Start Pages For Building A Mashup Personal Learning Environment To Support Self-Organized Learners*. Serdica Journal of Computing 3. (pp. 227–238).
218. Ivanova, M. (2009b). *From Personal learning Environment Building To Professional Learning Network Forming*. Paper presented at *The 5th International Scientific Conference elearning and software for education - eLSE 2009*, Bucharest April 09-10 2009.
219. Ivanova, M. (2009c). *Free Hosted eLearning 2.0 Platforms in Action*. eLearning Informatics. Retrieved from http://mivanova.blogspot.ro/2009/05/free-hosted-elearning-20-platforms-in.html.

220. Ivanova, M. (2010). *Design and Development of a 3 Dimensional Personal Learning Space*, 5th Plymouth e-Learning Conference: Learning without Limits: Facing the Challenges.
221. Ivanova, M. & Ivanov, G. (2011). *Using Marker Augmented Reality Technology for Spatial Space Understanding in Computer Graphics*. In Cherifi, H., Zain, J.M. & Eyas El-Qawasmeh (eds.), DICTAP (Digital Information and Communication Technology and Its Applications) Proceedings Part 1, Dijon France, June 2011, pp. 368-379, Springer Verlag Berlin Heidelberg.
222. Ivanova, M. & Ivanov, G. (2011a). *Enhancement of Learning and Teaching in Computer Graphics Through Marker Augmented Reality Technology*. In International Journal on New Computer Architectures and Their Applications (IJNCAA) 1(1): pp. 176-184, The Society of Digital Information and Wireless Communications, 2011.
223. Ivanova, M., Grosseck, G., Holotescu, C. (2012). *Analysis of Personal Learning Networks in Support of Teachers Presence Optimization*. PLE Conference, Aveiro Portugal, July 11-13, 2012;
224. Ivanova, M. & Panteva, P. (2013). *Exploration on the affective states and learning during an augmented reality session*. Presentation at The 9th International Scientific Conference "E-learning and Software for Education", Bucharest Romania, 25-26 April 2013.
225. Ivanova, M., & Popova, A. (2009). *An exploration of formal and informal learning flows in LMS2.0: Case study EDU2.0*. In Web Intelligence and Intelligent Agent Technologies, 2009. WI-IAT'09. IEEE/WIC/ACM International Joint Conferences on (Vol. 3, pp. 227-230). IET.
226. Iyengar, S., Hahn, K., Prior, M. (2001). Has technology made attention to political campaigns more selective? An experimental study of the 2000 presidential campaign. Annual Meeting of the American Political Science Association, San Francisco.
227. Jacobson, M., J. & Reimann, P. (Eds.). (2010). *Designs for Learning Environments of the Future. International Perspectives from the Learning Sciences*. Springer.
228. Jacoby, J. (2014). *The disruptive potential of the Massive Open Online Course: A literature review.* Journal of Open, Flexible and Distance Learning, 18(1), 73-85.
229. Jadu Research Report. (2010). *An investigation into the challenges, applications and benefits of social media in higher educational institutions*, report retrieved from http://www.jadu.co.uk/downloads/file/18/research_into_the_challenges_usage_and_benefits_of_social_media_in_higher_education_institutions.
230. Jarche, H. (2009). *Learning and microblogging*. Retrieved from http://www.jarche.com/2009/06/learning-and-micro-blogging/
231. Java, A., Song, X., Finn, T., & Tseng, B. (2009). *Why we Twitter: Understanding microblogging usage and communities*. Paper presented at the Proceedings of the Joint 9th WEBKDD and 1st SNA-KDD Workshop 2007. Retrieved September 30, 2009, from http://ebiquity.umbc.edu/paper/html/id/367/Why-We-Twitter-Understanding-Microblogging-Usage-and-Communities
232. JISC (2005). *The Personal Learning Environments Reference Model Project*, http://wiki.cetis.ac.uk/Ple.
233. JISC (2010). *Effective Assessment in a Digital Age*, report retrieved from http://www.jisc.ac.uk/digiassess.

234. JISC (2011). *Effective Use of Virtual Learning Environments*, http://www.jiscinfonet.ac.uk/InfoKits/effective-use-of-VLEs/index_html.
235. Johnson, M. & Liber, O. (2008). The Personal Learning Environment and the human condition: from theory to teaching practice. Interactive Learning Environments. 16 (1) (pp. 3-15).
236. Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Ludgate, H. (2013). *NMC Horizon Report: 2013 Higher Education Edition*.
237. Johnson, L., Adams Becker, S., Estrada, V., Freeman, A. (2014). *NMC Horizon Report: 2014 Higher Education Edition*. Austin, Texas: The New Media Consortium. Retrieved from http://www.nmc.org/pdf/2014-nmc-horizon-report-he-EN.pdf.
238. Jordan, K. (2013). *Synthesising MOOC completion rates*. *MoocMoocher Blog.* Retrieved from http://moocmoocher.wordpress.com/2013/02/13/synthesising-mooc-completion-*rates/.*
239. Joseph, D. (2004*). The practice of design-based research: Uncovering the interplay between design, research, and the real-world context*. Educational Psychologist, 39(4).
240. Junco, R., Heiberger, G. and Loken, E. (2011). The effect of Twitter on college student engagement and grades, In *Journal of Computer Assisted Learning*, 27(2):119–132. doi:10.1111/j.1365-2729.2010.00387.x.
241. Jungherr, A. (2010). Twitter in politics: Lessons Learned during the German Superwahljahr 2009. CHI 2010, April 10-15, Atlanta, Georgia, USA.
242. Juniper Research (2012). *Mobile Augmented Reality*. Retrieved from http://juniperresearch.com/reports/mobile_augmented_reality.
243. Kanter, B. (2011). *Content Curation Primer*. Retrieved from http://goo.gl/Ycvef.
244. Kaplan, A.M. & Haenlein, M. (2010). *Users of the world, unite! The challenges and opportunities of Social Media*. In *Business Horizons*, 53(1), pp. 59-68.
245. Katz, N. (editor). (2008). *The tower and the cloud*. Educause.
246. Keengwe, J. and Kidd, T. (2010). *Towards Best Practices in Online Learning and Teaching in Higher Education*. MERLOT Journal of Online Learning and Teaching Vol. 6, No. 2, June 2010. http://jolt.merlot.org/vol6no2/keengwe_0610.pdf.
247. Kelly, D. (2012). *Computers, Learning Professionals and their role in Curation, in Learning Circuits*. Retrieved from http://goo.gl/6e7uX.
248. Kerstin Borau, Carsten Ullrich, Jinjin Feng, Ruimin Shen. (2009). *Microblogging for Language Learning: Using Twitter to Train Communicative and Cultural Competence*. Paper presented at International Conference on Web-based Learning (ICWL) 2009, M. Spaniol et al. (Eds.): ICWL 2009, LNCS 5686, pp. 78–87, 2009. © Springer-Verlag Berlin Heidelberg 2009.
249. Keskin, N., Matcalf, D. (2011). *The current perspectives, theories and practices of mobile learning*. Published in *Turkish Online Journal of Educational Technology*, vol 10 (2).
250. Khaddage, F., E. Lanham, W. Zhou. (2009). *A Mobile Learning Model for Universities. Re-blending the Current Learning Environment*. International Journal of Interactive Mobile Technologies. vol 3, http://online-journals.org/i-jim/article/view/949/972.
251. Kirschner, P., Strijbos, J. W., Kreijns, K., & Beers, P. J. (2004). *Designing electronic collaborative learning environments*. Educational technology research and development, 52(3), 47-66.

252. Knox, J. et al. (2012). *MOOC Pedagogy: the challenges of developing for Coursera*. *ALT Online Newsletter*, 28(08.08), http://newsletter.alt.ac.uk/2012/08/mooc-pedagogy-the-challenges-of-developing-for-coursera/.
253. Kohen, A. (2010). *Twitter and Political Theory*. 2010 APSA Teaching and Learning Conference Paper. Available at SSRN: http://ssrn.com/abstract=1544632.
254. Koller, D. (2012). *How Online Courses Can Form a Basis for On-Campus Teaching*. In Forbes, http://www.forbes.com/sites/coursera/2012/11/07/how-online-courses-can-form-a-basis-for-on-campus-teaching/.
255. Koper, R., Tattersall, C. (2005). *Learning Design - A Handbook on Modelling and Delivering Networked Education and Training*. Springer.
256. Korn, M. (2014). *Corporate Training Gets an Online Refresh. MOOC Providers Find New Earnings Opportunities in Offering Web Courses to Companies*. In The Wall Street Journal, Oct 1, 2014. Retrieved from http://online.wsj.com/articles/corporate-training-gets-an-online-refresh-1412194344.
257. Kwak, H., Lee, C., Park, H., & Moon, S. (2010). *What is Twitter, a Social Network or a News Media?* WWW 2010, April 26–30, 2010, Raleigh, North Carolina, USA.
258. Latif, F. (2012). *CARE: Creating Augmented Reality in Education*. In T. Amiel & B. Wilson (Eds.), Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2012 (pp. 666-669). Chesapeake, VA: AACE. Retrieved from http://www.editlib.org/p/40817.
259. Laurillard, D. & Pachler, N. (2007). *Pedagogical forms of mobile learning: Framing research questions*. Mobile learning: Towards a research agenda, pp. 33-54. WLE Centre, Institute of Education, London.
260. Lee, M.J.W., McLoughlin, C. (eds.). 2011. *Web 2.0-Based E-Learning: Applying Social Informatics for Tertiary Teaching*. Information Science Reference, Hershey, New York.
261. Lenhart, A., Purcell, K., Smith, A. & Zickuhr, K. (2010). Social Media & Mobile Internet Use AmongTeens and Young Adults, A Pew Internet and American Life Project, http://pewinternet.org/Reports/2010/Social-Media-and_Young-Adults.aspx.
262. Letierce, J., Passant, A., Decker, S., Breslin, J.G. (2010). *Understanding how Twitter is used to spread scientific messages*. Web Science Conf. 2010, April 26-27, 2010, Raleigh, NC, US.
263. Liu, M., Kalk, D., Kinney, L., Orr, G. & Reid, M. (2009). *Web 2.0 and Its Use in Higher Education: A Review of Literature*. In T. Bastiaens et al. (eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2009*, pp. 2871-2880, Chesapeake, VA: AACE. retrieved from http://www.editlib.org/p/32892.
264. Livingston, B. (2010). *Using Web 2.0 Technologies*. INFOLINE Vol. 27. Issue 1001/January 2010. ASTD Press. Retrieved from http://goo.gl/8oFvs (accessed on 15 November 2010).
265. Loh, T. (2011). *Stop, Drop and Roll out Yammer*. Retrieved from http://blog.yammer.com/blog/2011/04/emergency-preparedness-with-yammer.html.
266. Luckin, R., Puntambekar, S., Goodyear, P., Grabowski, B. L., Underwood, J., & Winters, N. (Eds.). (2013). *Handbook of Design in Educational Technology*. Routledge.

267. Lundin, J., G. Lymer, L.E. Holmquist, B. Brown, and M. Rost. (2010). *Integrating students' mobile technology in higher education*. International Journal of Mobile Learning and Organisation. 4:1, s. 1-14 (2010).
268. Luo, T., & Gao, F. (2012). *Enhancing classroom learning experience by providing structures to microblogging-based activities*. Journal of Information Technology Education, 11.
269. Luukkainen, M., Vihavainen, A., & Vikberg, T. (2012). *Three years of design-based research to reform a software engineering curriculum*. In Proceedings of the 13th annual conference on Information technology education (pp. 209-214). ACM.
270. Luzón, M. J. (2009). *Scholarly hyperwriting: The function of links in academic weblogs*. Journal of the American Society for Information Science and Technology, 60: 75–89.
271. Magna Publication. Faculty Focus, Special Report (2010). *Twitter in Higher Education 2010: Usage Habits and Trends of Today's College Faculty.*
272. Malita, L. (2008). *Web 2.0 in Aula. A Challenge for Students Teachers and Universities*. Paper presented at *The 4th International Scientific Conference elearning and software for education - eLSE 2008*, Bucharest 17-18 April 2008.
273. Malita, L. (2011). *Social media time management tools and tips*. Procedia Computer Science, vol. 3, 2011, pp. 747-753, http://www.sciencedirect.com/science/article/pii/S1877050910004989.
274. Marquis, J. (2012). *Is Twitter the driving force behind upcoming educational challenge?*, Retrieved from http://www.onlineuniversities.com/blog/2012/03/is-twitter-the-driving-force-behind-upcoming-educational-change.
275. Martin, M., & Parker, S. (2008). *Why e-learning 2.0?* Learning Solutions Magazine, 1–8. Retrieved from http://www.learningsolutionsmag.com/articles/87/why-e-learning-20.
276. Mayernik, M., Pepe, A. (2009). *Microblogging from the field: ! capturing contextual information in highly mobile research !* Retrieved from http://research.cens.ucla.edu/events/?event_id=231.
277. McAndrew, P., & Jones, A. (2012). *Editorial: Massive Open Online Courses, a perspective paper by Sir John Daniel*. *Journal of Interactive Media in Education*, 3. http://www-jime.open.ac.uk/article/2012-17/pdf.
278. McAuley, A., Stewart, B., Siemens, G. & Cormier, D. (2010). *The MOOC model for digital practice.* In *SSHRC Knowledge Synthesis Grant on the Digital Economy*. Retrieved from http://www.edukwest.com/*wp-content/uploads/2011/07/MOOC_Final.pdf.*
279. McElvaney, J. & Berge, Z. (2009). *Weaving a Personal Web: Using online technologies to create customized, connected, and dynamic learning environment*s. Canadian Journal of Learning and Technology / La revue canadienne de l'apprentissage et de la technologie. V35(2) Spring / printemps.
280. McKenney, S. E., & and Reeves, T. C. (2012). *Conducting Educational Design Research*. Routledge, 2012.
281. McNeill, T. (2009). *More than just passing notes in class? Reflections on the Twitter-enabled backchannel*. Retrieved from http://www.scribd.com/doc/16287533/More-than-just-passing-notes-in-class-The-Twitterenabled-backchannel.
282. McNeill, T. (2010). *Twitter is dead: Reflections on student resistance to microblogging*. 5th Plymouth e-Learning Conference: Learning without Limits: Facing the Challenges.

283. McNely, B. (2009). *Backchannel Persistance and Collaborative Meaning-Making*. SIGDOC'09, October 5-7 2009. Bloomington Indiana, USA, ACM.
284. Mehlenbacher, B. (2012). *Massive open online courses (MOOCs): educational innovation or threat to higher education?* In *Proceedings of the Workshop on Open Source and Design of Communication* (OSDOC '12). ACM, New York, NY, USA, 99-99. http://doi.acm.org/10.1145/2316936.2316953.
285. Mendoza, M., Poblete, B. and Castillo, C. (2010). *Twitter Under Crisis: Can we trust what we RT?* In *1st Workshop on Social Media Analytics* (SOMA 10), KDD '10 Workshops, ACM, Washington, USA (July 25, 2010).
286. Merrill, N. (2011). *Social media for social research: Applications for higher education communications*. In Laura A. Wankel, Charles Wankel (ed.) *Higher Education Administration with Social Media (Cutting-edge Technologies in Higher Education, Volume 2)*, Emerald Group Publishing Limited, pp.25-48.
287. Microsoft. (2013). White Paper *Integrate Yammer with on-premises SharePoint 2013 environments*.Retrieved from http://www.microsoft.com/en-us/download/details.aspx?id=39357.
288. Milstein, S., Lorica, B. (2008). *Twitter and the Micro-Messaging Revolution: Communication, Connections, and Immediacy—140 Characters at a Tim*e. O'Reilly Media, 2008.
289. Mitchell, O. (2009). *How to Present with Twitter (and other backchannels)*. Retrieved from http://www.speakingaboutpresenting.com/wp-content/uploads/Twitter.pdf.
290. Mixare (2010). *Mixare – open source augmented reality engine*. http://www.mixare.org/.
291. Moore, G. (2011). *Survey of University of Toronto Faculty Awareness, Attitudes, and Practices Regarding Scholarly Communication: A Preliminary Report*. Online at http://hdl.handle.net/1807/26446.
292. Moran, M., Seaman, J. and Tinti-Kane, H. (2011). *Teaching, Learning and Sharing. How Today's Higher Education Faculty Use Social Media*. Pearson Learning Solution and babson Survey Research Group, http://www.pearsonlearningsolutions.com/educators/pearson-social-media-survey-2011-bw.pdf.
293. Morozov, E. (2010). *A twitter revolution without revolutionaries*. re.publica conference. Berlin 14-16 April. http://re-publica.de/10/event-list/a-twitter-revolution-without-revoluationaries.
294. Mott, J. (2010). *Envisioning the Post-LMS Era: The Open Learning Network*. Educause Quarterly Vol. 33(1), 2010. Retrieved from http://www.educause.edu/ero/article/envisioning-post-lms-era-open-learning-network.
295. Mott, J., & Wiley, D. (2013). *Open for learning: The CMS and the open learning network*. in education Journal, 15(2). Retrieved from http://ineducation.couros.ca/index.php/ineducation/article/view/53/529.
296. Mungiu-Pippidi, A., Munteanu, I. (2009). *Moldova's 'Twitter Revolution'*. Journal of Democracy, Vol. 20, No. 3, July 2009. Available at SSRN: http://ssrn.com/abstract=1529059.
297. Munster, J., Regenbrecht, H., Nowostawski, M. & Kohlhaas, M. (2011). *Using mobile Augmented Reality to implement the user experience of a Personal Augmented Space: location-based visualisation and interaction with social media (microblogging)*. In Information Science Postgraduate Day 2011. IS PGD 2011, August 26 2011, Dunedin, New Zealand.

298. Naaji, A., Herman, C., Mustea, A. (2013). *Implementation model for new technologies in online education*. In EAEEIE Annual Conference (EAEEIE), 2013 Proceedings of the 24th (pp. 71-75). IEEE.
299. Narkhede, P., Rajesh, P. and Kumar, S. (2010). *Analysis on General Profile of Plurk Users*. In *Rev Systems*, Bangalore. Retrieved from http://www.slideshare.net/bexdeep/plurk-analysis-4136802.
300. Nevas, B. (2010). *Inquiry Through Action Research: Effects of the Edmodo Microblog on Student Engagement and Performance*. Retrieved from http://www.scribd.com/doc/27372047/Edmodo-Research.
301. Nielsen, J. 2006. *Participation Inequality: Encouraging More Users to Contribute*. Available at http://www.useit.com/alertbox/participation_inequality.html.
302. NMC Horizon Report Project (2012). *Short List, Higher Education Edition*, retrieved from http://horizon.wiki.nmc.org/file/view/2012-Horizon.HE-Shortlist.pdf.
303. NMC Horizon Report Project (2013). *Short List, Higher Education Edition*, retrieved from http://www.nmc.org/pdf/2013-horizon-higher-ed-shortlist.pdf.
304. NMC Horizon Report Project (2008-2014). *2010-2014 Higher Ed Edition*. Retrieved from http://www.nmc.org/publications.
305. NMC Horizon Report Project (2015). *2015 Higher Education Preview*. Retrieved from http://cdn.nmc.org/media/2015-horizon-he-preview.pdf.
306. NMC Horizon Report Project (2015a). 2015 *Higher Education Edition. Final Results.* Retrieved from http://cdn.nmc.org/media/2015-horizon-he-final-results.pdf.
307. Nurmela, S. (2009). *Critical review and comparative analyses of European action research projects: Mobile Pedagogy – Course*. http://portaal.e-uni.ee/ejump/wp-resources/wp1/case-studies-1/mobile_pedagogy_course.pdf.
308. O'Connory, B., Balasubramanyany, R., Routledgex, B.R., Smithy, N.A. (2010). *From Tweets to Polls: Linking Text Sentiment to Public Opinion Time Series*. Proceedings of the International AAAI Conference on Weblogs and Social Media, Washington, DC, May 2010.
309. O'Reilly, T.(2005). *What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software*, retrieved from http://oreilly.com/web2/archive/what-is-web-20.html.
310. OECD (2007). *Giving Knowledge for Free – The Emergence Of Open Educational Resources*. Retrieved from http://www.oecd.org/edu/ceri/38654317.pdf.
311. OLCOS (2012). *Open Educational Practices and Resources*. Retrieved from http://www.olcos.org/english/roadmap/.
312. Online Educa (2010). *Summary report on the Workshop Assessing Learning in a Digital World*. Online Educa Conference Berlin, 2010. Retrieved from http://eacea.ec.europa.eu/llp/events/2010/online_educa_conference_berlin_2010_en.php
313. OPAL. (2011). Open Educational Quality Initiative. *OEP Guide. Guidelines for open educational practices in organizations.* Retrieved from http://www.oer-quality.org/wp-content/uploads/2011/03/OPAL-OEP-guidelines.pdf.
314. Open Learning Design Studios MOOC - OLDS. (2012). *pMOOC pedagogical pattern*. Retrieved from http://www.olds.ac.uk/blog/pmoocpedagogicalpattern.
315. Ovadia, S. (2009). *Exploring the Potential of Twitter as a Research Tool*. In *Behavioral & Social Sciences Librarian*, 28:4, pp. 202-205.

316. Papacosta, D. (2011). *Content curation strategies and tacticsi*. Presented at the IABC Western Region conference, Whistler, BC, Nov. 8, 2011.
317. Parker, J., Maor, D., & Herrington, J. (2013). *Authentic online learning: Aligning learner needs, pedagogy and technology*. Issues in Educational Research, 23(2).
318. Parry, D. (2008). *Twitter for Academia.* Blog post retrieved from http://academhack.outsidethetext.com/home/2008/twitter-for-academia.
319. Parsons, A. (2010). *Academic Liaison Librarianship: Curatorial Pedagogy Or Pedagogical Curation?* In Ariadne no. 65. Retrieved from http://goo.gl/lq7MQ.
320. Passant, A., Hastrup, T., Bojars, U. and Breslin, J. (2008). *Microblogging: A Semantic and Distributed Approach*. In *Proceedings of the 4th Workshop on Scripting for the Semantic Web*, Tenerife, Spain, June 02, 2008, CEUR Workshop Proceedings.
321. Patten, B., Sanchez, A. and Tangney, B. (2006). *Designing collaborative, constructionist and contextual applications for handheld devices*. In *Computers & Education*, 46, 294-308.
322. Pearson eCollege (2012). *REST API Tutorial*. Retrieved from http://www.restapitutorial.com.
323. Penela, V., Álvaro, G., Ruiz, C., Córdoba, C., Carbone, F., Castagnone, M., & Contreras, J. (2011). *miKrow: Semantic intra-enterprise micro-knowledge management system*. The Semanic Web: Research and Applications, 154-168.
324. Pew Internet (2009). *Social Networking Reports*. http://www.pewinternet.org/topics/Social-Networking.aspx.
325. Pistachio Consulting (2008). *Enterprise Microsharing Tools Comparison*. Retrieved from http://pistachioconsulting.com/services/research/.
326. Plomp, T., & Nieveen, N. (2007). *An introduction to educational design research*. In Proceedings of the Seminar Conducted at the East China Normal University [Z]. Shanghai: SLO-Netherlands Institute for Curriculum Development. Retrieved from http://www.slo.nl/downloads/2009/introduction_20to_20education_20design_20research.pdf/.
327. Polat, R. K. (2005). *The Internet and Political Participation: Exploring the Explanatory Links*. European Journal of Communication 2005; 20; 435, http://ejc.sagepub.com/cgi/content/abstract/20/4/435.
328. Popescu, E. (2012). *Providing collaborative learning support with social media in an integrated environment*. World Wide Web, 17(2), 199-212.
329. Popescu, G.H. (2009). *Hai la lupta cea mare cu Twitter la votare*. Retrieved from http://www.cyberculture.ro/blog/2009/11/20/hai-la-lupta-cea-mare-cu-twitter-la-votare/.
330. Popova, M. (2012). *Introducing The Curator's Code: A Standard for Honoring Attribution of Discovery Across the Web*. Retrieved from http://goo.gl/yvDP4.
331. Porter, J. E. (2013). *MOOCs, Courses and the Question of Faculty and Student Copyrights*. *The CCCC-IP Annual: Top Intellectual Property Developments of 2012*, 2.
332. Prensky, M. (2001). *Digital Natives, Digital Immigrants*. In On the Horizon, MCB University Press, Vol. 9/5.
333. Priem, J., Hemminger, B.M. (2010). *Scientometrics 2.0: Toward new metrics of scholarly impact on the social Web*. In First Monday, Vol.15, Number 7, 5 July 2010.
334. Procter, R., Williams, R., & Stewart, J. (2010a*). If you build it, will they come? How researchers perceive and use Web 2.0*. A Research Information

Network Report. Retrieved from www.rin.ac.uk.
335. Procter, R., Williams, R., Stewart, J., Poschen, M., Snee, H., Voss, A., & Asgari-Targhi, M. (2010b). *Adoption and use of Web 2.0 in scholarly communications*. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 368(1926), 4039-4056. Retrieved from http://rsta.royalsocietypublishing.org/content/368/1926/4039.short.
336. ProgrammableWeb (2013). *Protocol Usage by APIs*. http://www.programmableweb.com/apis.
337. Rasiah, V., & Ratneswary, R. (2014). *Transformative Higher Education Teaching and Learning: Using Social Media in a Team-based Learning Environment*. Procedia-Social and Behavioral Sciences, 123, 369-379.
338. Rees, R., Metcalfe, M. (2009). *Ravensbourne Learner Integration Project*. Final report. JISC. Retrieved from http://confluence.rave.ac.uk/confluence/display/SCIRCLINR/Home.
339. Reeves, T. C. (2006). *Design research from a technology perspective*. Educational design research, 1(3), 52-66.
340. Reimann, P. (2013). *Design-Based Research - Designing as Research*. In Luckin, R., Puntambekar, S., Goodyear, P., Grabowski, B. L., Underwood, J., & Winters, N. (Eds.). (2013). *Handbook of Design in Educational Technology*. Routledge.
341. Reinhardt, W., Ebner, M., Beham, G, Costa, C. (2009). *How people are using Twitter during conferences*. In V. Hornung-Prähauser, M. Luckmann (eds.), 5th EduMedia conference (pp.145-156), Salzburg.
342. Rodriguez, C. O. (2012). *MOOCs and the AI-Stanford like Courses: Two Successful and Distinct Course Formats for Massive Open Online Courses*. *EURODL European Journal of Open, Distance and E-learning*. http://www.eurodl.org/?article=516.
343. Rosenbaum, S. (2011). *Curation Nation. How to Win in a World Where Consumers are Creators*. Mc-Graw-Hill Professional.
344. Ross, C., Terras, M., Warwick, C. & Welsh, A. (2010). *Pointless Babble or Enabled Backchannel: Conference Use of Twitter by Digital Humanists*. Paper presented at Digital Humanities 2010. King's College London, Retrieved from http://dh2010.cch.kcl.ac.uk/academic-programme/abstracts/papers/pdf/ab-620.pdf.
345. Rusu, A.A., Serbanescu, A., Clondir, R. & Popovici, D. (2013). *Social Media for preserving local technological traditions*. In Proceedings of SMART 2013: Social Media in Academia: Research and Teaching, Bacau Romania, June 6-9, 2013.
346. Saunders, N., Beltrão, P., Jensen, L., Jurczak, D., Krause, R., Kuhn, M., Wu, S. (2009). *Microblogging the ISMB: a new approach to conference reporting*. PLoS Comput Biol 5(1): e1000263. doi:10.1371/journal.pcbi.1000263.
347. Schaeffert, S. & Ebner, M. (2010). *New Forms of and Tools for Cooperative Learning with Social Software in Higher Education*. In *Computer-Assisted Teaching: New Developments*; B.A. Morris & G.M. Ferguson (eds.), Nova Publishing, pp. 151-156.
348. Schaffert, S. (2010). *Strategic Integration of Open Educational Resources in Higher Education. Objectives, Case Studies, and the Impact of Web 2.0 on Universities*. In: U. Ehlers & D. Schneckenberg (eds.), *Changing Cultures in Higher Education - Moving Ahead to Future Learning*, New York: Springer, pp. 119-131.
349. Scoble, R. (2009). *The new billion-dollar opportunity: real-time-web curation*. Retrieved from http://goo.gl/az5Xk.

350. Seitzinger, J. (2012). *When Educators Become Curators*. Virtual keynote at the Croatian MoodleMoot, June 2012. Retrieved from http://goo.gl/hiB7g.
351. Selwyn, N. (2009). *Web 2.0 and the school of the future, today*. Paper presented to OECD/CERI Expert meeting on 'The School of the Future, Today' Santa Catarina, Brazil, 18th to 20th November 2009, Retrieved from http://www.scribd.com/doc/24171406/Web-2-0-and-the-school-of-the-future-today.
352. Serbanuta, C., Chao, T. & Takazawa, A. (2010). *Save the tweets so you can understand the birds*. Paper presented at iConference 2010. Champaign. Illinois. Retrieved from http://goo.gl/PY5Pz.
353. Sclater, N. (2014). *Analytics systems centred around the VLE/LMS*. In Effective Learning Analytics. Retrieved from http://analytics.jiscinvolve.org/wp/2014/10/08/analytics-systems-centred-around-the-vlelms-2/.
354. Shamma, D., Kennedy, L. & Churchill, E. (2010b). *Conversational Shadows: Describing Live Media Events Using Short Messages*. Paper presented at International AAAI Conference on Weblogs and Social Media. AAAI, Washington DC (2010). Retrieved from http://research.yahoo.com/files/shouting-short.pdf.
355. Shamma, D., Kennedy, L. and Churchill, E. (2009). *Tweet the Debates*. Paper presented at *WSM'09* October 23, 2009, Beijing, China.
356. Shamma, D., Kennedy, L. and Churchill, E. (2010). *Twetgeist: Can the Twitter Timeline Reveal the Structure of Broadcast Events?* Paper presented at *CSCW 2010*, February 610, 2010, Savannah, Georgia, USA.
357. Sharples, M., Adams, A., Ferguson, R., Gaved, M., McAndrew, P., Rienties, B., Weller, M., & Whitelock, D. (2014). *Innovating Pedagogy 2014: Open University Innovation Report 3*. Milton Keynes: The Open University. Retrieved from http://www.open.ac.uk/innovating.
358. Shen, T.W. (2010). *Plurk Intervention on Artificial Intelligent Learning for Higher Education*. Paper presented at *2010 Conference on Teaching Excellence*, 29-30 Nov. 2010. http://tec.tcu.edu.tw/et2010/paper/27.pdf.
359. Shepherd, T. (2009). *Twittering in the OECD's "participative web": Microblogging and new media policy*. Global Media Journal, Canadian Edition, 2(1), Pag. 149-165.
360. Siemens, G. (2005). *Connectivism: A learning theory for the digital age*. International journal of instructional technology and distance learning, 2(1), 3-10. Retrieved from http://www.itdl.org/Journal/Jan_05/article01.htm.
361. Siemens, G. (2010). *Managing and Learning in MOOCs (massive open online courses)*. Retrieved from http://auspace.athabascau.ca:8080/handle/2149/2838.
362. Siemens, G. (2014). *What I've learned in my first week of a dual-layer MOOC (DALMOOC)*. Retrieved from http://www.elearnspace.org/blog/2014/10/28/what-ive-learned-in-my-first-week-of-a-dual-layer-mooc-dalmooc/.
363. Siemens, G., & Long, P. (2011). *Penetrating the fog: Analytics in learning and education*. Educause Review, 46(5), 30-32.
364. Simões, T., Rodrigues, J. J., & de la Torre, I. (2013). *Personal Learning Environment Box (PLEBOX): A new approach to E-learning platforms*. Computer Applications in Engineering Education, 21(S1), E100-E109.
365. Skill, A., Carhart, J., Houton, D & Wheeler, S. (2010). *Integrating Personal Learning Environments into the Primary classroom*. 5th Plymouth e-Learning Conference: Learning without Limits: Facing the Challenges.

366. Smith, A. & Brenner, J. (2012). *Twitter Use 2012.* A report by Pew Research Center. Retrieved from http://pewinternet.org/~/media//Files/Reports/2012/PIP_Twitter_Use_2012.pdf.
367. Smith, A. (2010*). Mobile Access 2010*. A project of Pew Research Center, http://pewinternet.org/Reports/2010/Mobile-Access-2010.aspx.
368. Smith, D. A., Van Kleek, M., Seneviratne, O., Bertails, A., Berners-Lee, T., Hall, W., & Shadbolt, N. (2012). *WebBox: Supporting Decentralised and Privacy-respecting Micro-sharing with Existing Web Standards*. WWW2012 Lyon, France.
369. Solis, B. & JESS3. (2010). *Introducing The Conversation Prism Version 3.0*. Retrieved from http://www.briansolis.com/2010/10/introducing-the-conversation-prism-version-3-0.
370. Solis, B. (2010). *Defining Social media: 2006-2010*. Blog post retrieved from http://www.briansolis.com/2010/01/defining-social-media-the-saga-continues/.
371. Solis, B. (2012). *The State of Twitterverse 2012*. Blog post retrieved from http://socialmediatoday.com/node/457621 on March 1, 2012.
372. Stacey, P. (2011). *Musings on the edtech frontier, 2011 The Year of Open*. Retrieved from http://edtechfrontier.com/2011/12/21/2011-the-year-of-open.
373. Starcic, A.I., Turk, Z. (2010). *Powerful Learning Environments in Engineering Education*. 7th WSEAS International Conference on Engineering/International Conference on Education and Educational Technologies, Corfu Island, Greece, Jul 22-24, 2010. http://www.wseas.us/e-library/conferences/2010/Corfu/EDUCATION/EDUCATION-72.pdf
374. Stefan, L. & Gheorghiu, D. (2013). *Participative teaching for K-12 students with mobile devices and social networks*. In Proceedings of SMART 2013: Social Media in Academia: Research and Teaching, Bacau Romania, June 6-9, 2013.
375. Stein, J. (2014). *"I fought the LMS…": My First 10 Years With Learning Management Systems*. Education, Technology, Nerd Stuff, Culture. Retrieved from http://jaredstein.org/2014/09/i-fought-the-lms-my-first-10-years-with-learning-managment-systems.
376. Stutzman, F. (2009). *Information Seeking During a Life Transition*. AOIR 2009 Doctoral Colloquium, Milwaukee, http://fredstutzman.com/papers/AOIRDC2009_Stutzman.pdf.
377. Suster, M. (2010). *The Power of Twitter in Information Discovery*. Retrieved from http://goo.gl/lwSTN.
378. Sutton, J. (2010). *Twittering Tennessee: Distributed Networks and Collaboration Following a Technological Disaster*. Proceedings of the 7th International ISCRAM Conference – Seattle, USA, May 2010.
379. Taraghi, B., Ebner, M. & Schaffert, S. (2009). *Personal Learning Environments for Higher Education: A Mashup Based Widget Concept*. Publication at Proceedings of the Second International Workshop on Mashup Personal Learning Environments (MUPPLE09). http://ceur-ws.org/Vol-506/.
380. Tenita, A. (2010). *Evoluţia twittosferei româneşti din iulie 2006 până în mai 2010. Un studiu Zelist.ro*. Retrieved from http://www.pr-romania.ro/articole/pr-20/717-evolutia-twittosferei-romanesti-din-iulie-2006-pana-in-mai-2010.html.
381. The Committee of Inquiry into the Changing Learner Experience (March 2009). *Higher Education in a Web 2.0 World*, available at http://www.clex.org.uk.
382. The New Teacher Project (2009). *Teacher Evaluation 2.0.* Retrieved from http://tntp.org/files/Teacher-Evaluation-Oct10F.pdf.

383. The OPAL Report 2011 (2011). *Beyond OER: Shifting Focus from Resources to Practices*. Retrived from http://duepublico.uni-duisburg-essen.de/servlets/DerivateServlet/Derivate-25907/OPALReport2011-Beyond-OER.pdf.
384. Thompson, K. (2011). *7 Things You Should Know about MOOCs*. *Educause Learning Initiative*. Retrieved from http://net.educause.edu/ir/library/pdf/eli7078.pdf.
385. Tinoca, L. (2011). *Assessment 2.0*. Presentation at http://www.slideshare.net/luistinoca/assessment-20-10291238.
386. Trafic.ro Statistics (2008). http://www.trafic.ro/centru-presa/comunicate/trafic-ro-romanii-sunt-foarte-pasionati-de-jocurile-online.
387. Traxler, J. (2009). *Current state of mobile learning.* In Ally, M. (ed.) Mobile Learning. Transforming the Delivery of Education and Training, AU Press, Athabasca University.
388. Tremblay, J. (2010). *Twitter: Can It Be a Reliable Source of News?* In Nieman Reports. Summer 2010. Retrieved 17 August 2010 from http://goo.gl/4Me2s.
389. Trilling, B. and Fadel, C. (2009): *21st Century Skills: Learning for Life in Our Times*. John Wiley and Sons.
390. Tu, Bau-Min et al. (2011). *Applying the Perspective of Technology Sensemaking to Plurk User Behaviors: An Exploratory Study*. In *HICSS '11 Proceedings* of the 2011 44th Hawaii International Conference on System Sciences.
391. Tudor. S. (2008). *Politica 2.0. Politica marketingului politic.* Tritonic Publishing House, Buchar
392. Tumasjan, A., Sprenger, T.O., Sandner, P.G., Welpe, I.M. (2010). *Predicting Elections with Twitter: What 140 Characters Reveal about Political Sentiment*. In Proceedings of the Fourth International AAAI Conference on Weblogs and Social Media.
393. U.S. Department of Education, Office of Educational Technology (2010). *Transforming American Education: Learning Powered by Technology.* Washington, D.C., Retrieved from http://www.ed.gov/technology/netp-2010.
394. UNESCO. (2002). *Forum on the Impact of Open Courseware for Higher Education in Developing Countries*: Final report. Retrieved from http://unesdoc.unesco.org/images/0012/001285/128515e.pdf.
395. UNESCO, Commonwealth of Learning (2011). *Guidelines for Open Educational Resources (OER) in Higher Education*. Retrieved from http://www.col.org/PublicationDocuments/Guidelines_OER_HE.pdf.
396. UNESCO (2013). *UNESCO Policy Guidelines for Mobile Learning*. Retrieved from http://unesdoc.unesco.org/images/0021/002196/219641e.pdf.
397. Unsworth, J. (2008). *University 2.0*. In Katz, R. (ed.). The Tower and the Cloud. Higher Education in the Age of Cloud Computing. 2008. EDUCAUSE. pp. 227-238, Retrieved from http://net.educause.edu/ir/library/pdf/PUB7202w.pdf
398. Uys, D.P. (2010). *Blended Learning in the ICT-Enabled Learning and Teaching Community of Practice at Charles Sturt University*. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2010* (pp. 258-267). Chesapeake, VA: AACE. Retrieved from http://www.editlib.org/p/34647.
399. Van Buskirk, E. (2009). *Open Source 'Twitter' Could Fend Off the Next Twitpocalypse*, Wired, August 10, 2009, http://www.wired.com/epicenter/2009/08/twitpocalypse.

400. Van Harmelen, M., Metcalfe, M. & Randall, D. (2009). The Manchaster PLE Project. JISC Emerge Benefits Realisation. http://reports.jiscemerge.org.uk/Benefits-Realisation/View-category.html, web-pages accessed on 10 June 2010.
401. Vaughan-Nichols, S.J.(2012). *How Twitter tweets your tweets with open source*. ZDNet. Retrieved from http://www.zdnet.com/how-twitter-tweets-your-tweets-with-open-source-7000003526/.
402. Vieweg, S. (2010). *The Ethics of Twitter Research*. In CSCW 2010 Workshop on Revisiting Ethics in the Facebook Era: Challenges in Emerging CSCW Research.
403. Viticci, F. (2010). *Twitter, Curation and iPad: Meet Tweet Library*. Retrieved from http://goo.gl/BQMr.
404. Warren, Mark E. (2002). *What Can Democratic Participation Mean Today?.* Political Theory 30: 677–701.
405. Walters, H. (2014). *We need to change everything on campus: Anant Agarwal of edX on MOOCs, MIT and new models of higher education*. Retrieved from http://blog.ted.com/2014/01/27/we-need-to-change-everything-on-campus-anant-agarwal-of-edx-on-moocs-mit-and-new-models-of-higher-education/.
406. Waters, S. (2008-2010). *PLN yourself*. http://suewaters.wikispaces.com/Twitter.
407. Watters, A. (2012a) *Top Ed-Tech Trends of 2012: MOOCs*. Retrieved from http://www.hackeducation.com/2012/12/03/top-ed-tech-trends-of-2012-moocs/.
408. Watters, A. (2012b). *Edmodo makes the move from Social network to Educational platform*, blog post retrieved from http://hackeducation.com/2012/03/06/edmodo-makes-the-move-from-social-network-to-education-platform/ on March 12, 2012.
409. Wecker, M. (2011), *Yammer Trumps Facebook for Some Graduate Students*, US News Education, Oct 24, 2011. Retrieved from http://www.usnews.com/education/best-graduate-schools/articles/2011/10/24/yammer-trumps-facebook-for-some-graduate-students.
410. Weisberger, C. & Butler, S. (2012). *Re-envisioning Modern Pedagogy: Educators as Curators*. Presentation given at SXSWedu. Retrieved from http://goo.gl/xpg4W.
411. Weller, M. (2010). *Big and Little OER*. Open Ed 2010 Proceedings, Barcelona. Available at http://hdl.handle.net/10609/4851.
412. Weller, M. (2014). *The Battle For Open: How openness won and why it doesn't feel like victory*. London: Ubiquity Press. Retrieved from http://www.ubiquitypress.com/site/books/detail/11/battle-for-open/.
413. Wheeler, S. (2010a). *Digital Tribes And The Social Web: How Web 2.0 Will Transform Learning In Higher Education*. Keynote speech, Engaging the Digital Generation in Academic Literacy: Learning and Teaching Conference, University of Middlesex, England. Retrieved from http://www.slideshare.net/timbuckteeth/digital-tribes-and-the-social-web.
414. Wheeler, S. (2010b). *PLE vs VLE*. 23 March 2010. Retrieved from http://steve-wheeler.blogspot.com/2010/03/ple-vs-vle.html.
415. Wild, F. (ed.) (2009). *Mash-Up Personal Learning Environments*. iCamp Deliverable D3.4. Retrieved from http://www. icamp. eu/wp-content/uploads/2009/01/d34_icamp_ final. pdf.

416. William, R. (2011). *Edmodo*. Retrieved from http://richardeducate.blogspot.com/2011/07/2nd-project-edmodo.html.
417. Williams, M., & Whyte, T. (2011). *Connectivism. Technology-enhanced Learning Environments*. Retrieved from http://etec.ctlt.ubc.ca/510wiki/Connectivism.
418. Wilson, S. (2005, Jan 25). *Future VLE – The Visual Version*. Retrieved from http://zope.cetis.ac.uk/members/scott/entries/20050125170206.
419. Winer, D. (2009). *What is the real time web?*. Retrieved from http://scripting.com/stories/2009/09/22/whatIsTheRealtimeWeb.html.
420. Wu, H. K., Lee, S. W. Y., Chang, H. Y., & Liang, J. C. (2013). *Current status, opportunities and challenges of augmented reality in education*. In Computers & Education no. 62, pp. 41–49.
421. Xu, T., Chen, Y., Jiao, L., Zhao, B. Y., Hui, P., & Fu, X. (2011). *Cuckoo: Scaling Microblogging Services with Divergent Traffic Demands*. Technical Report IFI-TB-2011-01, Univ. of Goettingen.
422. Yuan, L., Powell, S. (2013). *MOOCs and open education: Implications for higher education*. JISC Cetis. Retrieved from http://publications.cetis.ac.uk/wp-content/uploads/2013/03/MOOCs-and-Open-Education.pdf.
423. Yuen, S., Yaoyuneyong, G. & Johnson, E. (2011). *Augmented reality: An overview and five directions for AR in education*. Journal of Educational Technology Development and Exchange 4.1.
424. Yuksel, P., Robin, B.R. and McNeil, S. (2011). *Educational Uses of Digital Storytelling Around the World*. Retrieved from http://digitalstorytelling.coe.uh.edu/survey/SITE_DigitalStorytelling.pdf.
425. Zeng, L., Hall, H., Pitts, M.J. (2011). *Cultivating a Community of Learners. The Potential Challenges of Social Media in Higher Education*. In Noor Al-Deen, H. and Hendricks, J.A. 2011. *Social Media: Usage and Impact*, Lexington Books.
426. ZeTweety. (2010). *ROTwitterSurvey2010*. Online at http://slideshare.net/manafu/rotwitter-survey-2010-updated, http://www.zelist.ro/zetweety.html.

Appendix: Publications and Projects

a. Articles

ISI Proceedings

1. *Carmen Holotescu*, Gabriela Grosseck. (2009). *Using Microblogging to Deliver Online Courses. Case-study: Cirip.ro.* World Conference on Educational Sciences, Nicosia, North Cyprus, 4-7 February 2009 - New Trends and Issues in Educational Sciences, Edited by Huseyin Uzunboylu and Nadire Cavus, vol. I, Procedia Social and Behavioral Sciences, Elsevier, 2009, pag. 495-591, ISSN: 1877-0428;
2. *Carmen Holotescu*, Gabriela Grosseck. (2010a). *Learning to microblog and microblogging to learn. A case study on learning scenarios in a microblogging context*. Conference Proceedings of "eLearning and Software for Education", April 2010, issue: 01/2010, pages: 365-374;
3. Gabriela Grosseck, *Carmen Holotescu*. (2010a). *Microblogging multimedia-based teaching methods best practices with Cirip.eu* . World Conference on Educational Sciences, Istanbul, Turcia, 4-8 February 2010 - Procedia - Social and Behavioral Sciences - Innovation and Creativity in Education, WCES 2010, Volume 2, Issue 2, 2010, pages 2151-2155, published by Elsevier Ltd., ISSN: 1877-0428;
4. Gabriela Grosseck, *Carmen Holotescu*. (2010b). *Learning from the Stream. An "M" Case Study: M for microblogging, my-conference/my event and micro/my learning*. Proceedings of ICVL 2010, The 5th International Conference on Virtual Learning, "Virtual Learning – Virtual Reality", pp. 172-178, Targu-Mures, Romania;
5. *Carmen Holotescu*, Gabriela Grosseck. (2010b). *Tracing learning through spectrum of conversations. A microblogging approach to students' experience on learning and research*. Procedia – Social and Behavioral Sciences, World Conference on learning teaching and administration, 29-31 October 2010, The American University Cairo Egipt (WCLTA 2010);
6. *Carmen Holotescu*, Gabriela Grosseck. (2011). *Mobile learning through microblogging*. Procedia – Social and Behavioral Sciences, Volume 15, 2011, Pages 4-8, 3rd World Conference on Educational Sciences – 2011 (WCES 2011);
7. Gabriela Grosseck, *Carmen Holotescu*. (2011a). *Academic Research in 140 characters or less*. Conference proceedings of "eLearning and Software for Education" Bucharest,28-29 April 2011, vol.2/2011, ISSN 2066-026X;
8. Gabriela Grosseck, *Carmen Holotescu*. (2011b). *Understanding (the use of) microblogging as a virtual environment for teaching and learning in academic courses*. The 6th International Conference on Virtual Learning, NEW TECHNOLOGIES IN EDUCATION AND RESEARCH, 28-29 Octombrie 2011, Cluj-Napoca, Romania;
9. Gabriela Grosseck, *Carmen Holotescu*. (2011c). *Teacher education in 140 characters - microblogging implications for continuous education, training, learning and personal development*. Procedia – Social and Behavioral Sciences, vol.11, 2011, Teachers for the Knowledge Society, pag.160-164, The First International Conference "Teachers for the Knowledge Society", 17-19 March, 2011 Sinaia Romania, ISSN: 1877-0428;

10. Marius Călin Popoiu, Gabriela Grosseck, *Carmen Holotescu*. (2012). *What do we know about the use of social media in medical education?.* 4th WORLD CONFERENCE ON EDUCATIONAL SCIENCES (WCES-2012) 02-05 February 2012 Barcelona, Spain. Procedia - Social and Behavioral Sciences, Volume 46, 2012, Pages 2262–2266;
11. *Carmen Holotescu*, Gabriela Grosseck. (2012). *An empirical analysis of the educational effects of Social Media in universities and colleges*. The 8th International Scientific Conference „eLearning and software for Education" Bucharest, April 26-27, 2012, ISSN 2066-026X;
12. *Carmen Holotescu*, Liliana Cismariu, Maria Fernanda Spina, Gabriela Grosseck, Antoanela Naaji, Mugurel Dragomir. (2012). *Identifying and preventing educators' burnout using a microblogging community*. 3rd World Conference on Psychology. Counselling and Guidance (WCPCG-2012), Izmir, Turkey, 9-12 May 2012. Procedia-Social and Behavioral Journal, ISSN: 1877-0428;
13. *Carmen Holotescu*, Gabriela Grosseck, Elena Danciu. (2013). *Educational digital stories in 140 characters: towards a typology of micro-blog storytelling in academic courses*. 5th World Conference on Educational Sciences, 05-08 February 2013, Sapienza University of Rome, Italy;
14. *Carmen Holotescu*, Gabriela Grosseck, Malinka Ivanova, Vladimir Creţu. (2013a). *Educational Augmented Reality and Location-Based Applications. Case Study: Microblogging*. Proceedings of the International Conference SMART 2013 - Social Media in Academia: Research and Teaching, June 6-9, Bacau, Romania, edited by Bogdan Patrut, Medimond - Monduzzi Editore International Proceedings Division, Bologna, Italy, ISBN 9788875876869;
15. *Carmen Holotescu*, Gabriela Grosseck, Vladimir Creţu. (2013b). *MOOC's Anatomy. Microblogging as the MOOC's Control Center*. The 9th eLearning and Software for Education Conference - eLSE 2013, Bucharest, April 25-26;
16. *Carmen Holotescu*, Vladimir Creţu, Gabriela Grosseck. (2014). *Microblogging architecture and scenarios for learning in mobile groups*. Procedia - Social and Behavioral Sciences, Volume 143, 14 August 2014, Pages 1158–1163. 3rd Cyprus International Conference on Educational Research, CY-ICER 2014, 30 January – 1 February 2014, Lefkosa, North Cyprus;
17. *Carmen Holotescu*, Gabriela Grosseck, Vladimir Creţu, Elena Danciu. (2014). *The power of the three words and one acronym: OER vs OER. Subtitle: I'm not an Ogre of the Enchanted Realm (of cyberspace). I'm an Omnipresent Educational Rescuer (because I use the OER!).* 6th World Conference on Educational Sciences (WCES), Malta, Procedia - Social and Behavioral Sciences Elsevier ScienceDirect, ISSN 1877-0428; *(not indexed yet);*
18. Gabriela Grosseck, Malinka Ivanova, *Carmen Holotescu*, Laura Malita. (2014). *Massive Open Online Courses as e-Bricks for Smart Cities*. 10th International Scientific Conference eLearning and Software for Education, Bucharest, ROMANIA, ISSN 2066 - 026X; *(not indexed yet);*
19. Malinka Ivanova, Gabriela Grosseck, *Carmen Holotescu*. (2014). *Open Educational Resources - How open they are?*. 10th International Scientific Conference eLearning and Software for Education, Bucharest, ROMANIA, ISSN 2066 - 026X; *(not indexed yet);*
20. *Carmen Holotescu*, Gabriela Grosseck, Vladimir Creţu, Antoanela Naaji. (2014). *Integrating MOOCs in Blended Courses*. 10th International Scientific Conference eLearning and Software for Education, Bucharest, ROMANIA, ISSN 2066 - 026X; *(not indexed yet);*

21. *Carmen Holotescu*. (2014). *Using Design Based Research for Building Open Learning Platforms*. Proceedings of the International Conference SMART 2014 - Social Media in Academia: Research and Teaching, Sept, Timisoara, Romania; *(not indexed yet);*
22. *Carmen Holotescu*, Maria Perifanou, Diana Andone, Gabriela Grosseck. (2014). *Exploring OERs and MOOCs for Learning of EU Languages.* Proceedings of the International Conference SMART 2014 - Social Media in Academia: Research and Teaching, Sept, Timisoara, Romania; *(not indexed yet);*
23. *Carmen Holotescu*, Giles Pepler. (2014). *Opening up education in Romania*. Proceedings of the International Conference SMART 2014 - Social Media in Academia: Research and Teaching, Sept, Timisoara, Romania; *(not indexed yet);*
24. Gabriela Grosseck, *Carmen Holotescu*, Ramona Bran, Malinka Ivanova (2015). *A Checklist for a MOOC Activist*. 11th International Scientific Conference eLearning and Software for Education, Bucharest, ROMANIA, April 2015; *(not indexed yet);*
25. *Carmen Holotescu*, Gabriela Grosseck, Vladimir Crețu, Liliana Cismariu. (2015). *Working with Visual Impairment in Romanian universities. Designing for Social Media empowerment*. 7th World Conference on Educational Sciences (WCES), Athens, Greece, February 2015; *(not indexed yet);*

BDI

1. Göran Karlsson, Margareta Hellström, *Carmen Holotescu*, Gabriela Grosseck, Roza Dumbraveanu. (2011). *Are We Ready to Move Towards a New Type of Teacher Training? Case Study: The WETEN Project*. The Third International Conference on Mobile, Hybrid, and On-line Learning, eL&mL 2011, February 23-28, 2011 - Gosier, Guadeloupe, France, ISBN: 978-1-61208-003-1. Scopus;
2. Gabriela-Alina Dumitrel, Teodor Todinca, *Carmen Holotescu*, Cosmina-Mariana Militaru. (2011). *Computational Tool for Techno-Economical Evaluation of Steam/Oxygen Fluidized Bed Biomass Gasification Technologies*. WASET 2011 INTERNATIONAL CONFERENCE, Venice, Italy, April 27-29, 2011, ISSN 2010-376X. Scopus;
3. *Carmen Holotescu*, Dorina Gutu, Gabriela Grosseck, Mona Bran. (2011). *Microblogging meets Politics: The Influence if Communication in 140 Characters on Romanian Presidential Elections*. In Romanian Journal of Communication and Public Relations, vol.13 , no.1(21), pag.37-47, ISSN 1454-8100. EBSCO, ProQuest, B+;
4. Malinka Ivanova, *Carmen Holotescu*, Gabriela Grosseck. (2014). *Multimedia, Hypermedia and Transmedia in Support of Learning*. The 5th International Workshop on Interactive Environments and Emerging Technologies for eLearning, Birmingham City University, July 2-4, 2014; IEEE;
5. Diana Andone, *Carmen Holotescu*, Gabriela Grosseck. (2014). *Learning Communities in Smart Cities. Case Studies*. "DUBAI 2020: Smart City Learning" Workshop Proceedings, Nov, Dubai, United Arab Emirates. IEEE;

International Journals

1. *Carmen Holotescu*, Gabriela Grosseck. (2011). *M3-learning - Exploring mobile multimedia microblogging learning*. World Journal on Educational Technology, Vol. 3, 3, 9, ISSN 1309-1506;
2. *Carmen Holotescu*, Gabriela Grosseck,. (2011). *Cirip.eu – An Educational Microblogging Platform around Objects 2.0*. Formare Erikson, nr.74, ISSN:

1825-7321;

International Conferences Proceedings

1. Dan Pescaru, *Carmen Holotescu*. (2002). *Authentication in an Online Learning Environment: A Case Study*. Proceedings RoEduNet Conference Cluj 2002;
2. *Carmen Holotescu*. (2003). *A Program for eLearning Facilitators*. 2nd International GIREP Seminar, Sept. 2003, Udine, Italy, pg. 155-160;
3. *Carmen Holotescu*. (2004). *A Program for Training the eTrainers*. Proceedings of the 6th International Conference on Technical Informatic, CONTI'2004, Timisoara, May 2004;
4. *Carmen Holotescu*. (2005). *eLearning for Managers*. Proceedings of E-COMM-LINE 2005, Sept, 2005, Bucharest, Romania;
5. *Carmen Holotescu*, Gabriela Grosseck. (2007). *Dezvoltarea competenţelor digitale în contextul tehnologiilor/ oportunităţilor Web 2. 0*. International Conference „Promoting Key Competences in formal and nonformal education the way to assuring professional and personal success in the European Knowledge Based Society", Info-Project – International Center for Self Education and Training, Baia Mare, 25-27 mai, pag. 17-23/2007, http://www. infoproject.baiamare.rdsnet.ro/Volum_2007.pdf, ISBN 978-973-88154-8-3;
6. *Carmen Holotescu*, Christine Nena Karagianni, Spyros Papadakis, Gabriela Grosseck. (2007). *A Methodology for Developing Blended Courses Integrated With Web2. 0 Technologies*. The 8th European Conference E-COMM-LINE 2007, 20-22 sept. IPA Publishing House Bucureşti, ISBN 13: 978-973-88046-6-1, ISBN10: 973-88046-6-3;
7. Vegard Engstrom, Leopold Mathelitsch, Wim Peeters, Francisco Esquembre, Marisa Michelini, Grzegorz Karwasz, *Carmen Holotescu*, Gren Ireson. (2007). *Teacher training of pupil-active learning in superconductivity and electromagnetizm with interactive animations, simulations, scenarios and minds-on simple experiments*. GIREP - EPEC Conference "Frontiers of Physics Education", 26-31 August. 2007, Opatija, Croazia, Faculty of Arts and Science, University of Rijeka, 2007, p 81;
8. Gabriela Grosseck, *Carmen Holotescu*. (2008). *Can we use Twitter in educational activities?*. The 4th International Scientific Conference e-Learning and Software for education (eLSE08);
9. *Carmen Holotescu*, Gabriela Grosseck. (2008). *Serious Fun in education: using microblogging*. Proceedings of the XIVth International Conference „Knowledge Based Organization", Academia de Forte Terestre „N. Balcescu", Sibiu, 27-29 nov. 2008, page 95-102, ISBN 1843 – 6722;
10. Gabriela Grosseck, *Carmen Holotescu*. (2008). *Is there educational blogging in Romania?*. Second International Communication Conference 8-10 mai Skopje, Macedonia, Glocal 2. 0 Blogging Evolution treated as Revolution, New York University Skopje, Macedonia, http://glocalconference.wordpress.com;
11. *Carmen Holotescu*, Gabriela Grosseck. (2009). *Using Microblogging For Collaborative Learning*. Volume „New Technology Platforms for Learning – Revisited. LOGOS Open Conference on strengthening the integration of ICT research effort", 19-20 Jan. 2009 Budapest, Hungary, EDEN - European Distance and E-learning Network, p. 71-80, ISBN 978-963-87914-1-2;
12. Gabriela Grosseck, *Carmen Holotescu*. (2009). *Indicators for the analysis of*

learning and practice communities from the perspective of microblogging as a provocative sociolect in virtual space. The 5th International Scientific Conference eLSE - eLearning and Software for Education, Bucharest, 9-10 April 2009;

13. *Carmen Holotescu*, Gabriela Grosseck. (2009). *Using microblogging in education. Case Study: Cirip.ro*. Proceedings 6th Conference on e-Learning Applications, "Explore, Share and Stimulate Research in e-Learning Applications", American University, Cairo, 10-12 January, 2009;
14. *Carmen Holotescu*, Gabriela Grosseck. (2009). *How to use microblogging platforms in education*. Proceedings ICL Conference, Villach Austria, 23 sept, 2009;
15. Gabriela Grosseck, *Carmen Holotescu*. (2010). *Using Microblogging in Education*. Proceedings Plymouth e-Learning Conference, April 8-9, 2010;
16. Gabriela Grosseck, *Carmen Holotescu*. (2010). *Anagramming PLE: Empowering Professional Learning through microblogging*. The 1st PLE Conference, Barcelona, Spain, 8-9 July, 2010, ISSN 2077-9119;
17. Gabriela Grosseck, *Carmen Holotescu*. (2010). *Microblogging meets Personal Learning Environment - a study case*. Proceedings of the International Conference „Education Facing Contemporary World Issues", EDUWORLD 2010, University of Pitesti, Romania 8-9 October, 2010, Pitesti, Romania, ISSN 1844-6272;
18. Gabriela Grosseck, *Carmen Holotescu*. (2011). *Sometimes going to university takes only 140 characters. E-book Madhouse of Ideas. The twitter experience*. Novador-Ediciones. http://madhouseofideas.org/?page_id=378;
19. *Carmen Holotescu*, Mirella Mioc, Gabriela Grosseck. (2012). *Assessment in Microblogging Enhanced Courses*. 11th WSEAS International Conference on DATA NETWORKS, COMMUNICATIONS, COMPUTERS (DNCOCO '12), Sliema, Malta, Sept 7-9 2012;
20. Malinka Ivanova, Gabriela Grosseck, *Carmen Holotescu*. (2012). *Analysis of Personal Learning Networks in Support of Teachers Presence Optimization*. PLE Conference, Aveiro Portugal, July 11-13, 2012;
21. Gabriela Grosseck, *Carmen Holotescu*, Elena Liliana Danciu. (2012). *Violence 2.0: A Review Of Social Media-Based Violence Experiences Among Teens*. SPECTO 2012- 3rd International Conference Social Work Perspective of Quasi-Coercive Treatment of Offenders "VIOLENCE AMONG ADOLESCENTS", UVT Timisoara,May, 2012;
22. Antoanela Naaji, Anca Mustea, *Carmen Holotescu*, Cosmin Herman. (2014). *Aspects regarding the relevant components of online and blended courses*. 8th International Conference on Circuits, Systems, Communications and Computers, ISBN 960-8052-82-3.

National Conferences / Journals

1. *Carmen Holotescu*. (2003). *Cursuri online in Invatamantul Superior de Calculatoare*. Conference "Educational Technologies in Engineering Higher Education", UPB, 2003, Bucuresti;
2. *Carmen Holotescu*. (2003). *eLearning at Timsoft*. "Tehnology and Education", Bulletin of Laboratory for IT, nr. 2. , June 2003;
3. *Carmen Holotescu*. (2004). *Cursuri online in universitati. Strategii de facilitare*. Sesiune de Comunicari Stiintifice: Eficienta si calitate in Invatamantul Superior – Sibiu, iunie 2004, pg. 66-72;

4. *Carmen Holotescu*. (2005). *O analiza a blogosferei romanesti*. Lucrarile Seminarului Linux si medii virtuale de instruire, UVVG Arad, Sept, 2005
5. *Carmen Holotescu*. (2007). *Avantajele utilizării resurselor educaţionale deschise*. Studia Universitatis Vasile Goldiş Arad, pg 103-106, vol 16, cod CNCIS 438 (cat. C);
6. *Carmen Holotescu*. (2007). *Despre RSS. Utilizari in educatie*. Revista de Informatica Sociala, UVT, anul IV, nr. 7, iunie 2007. ISSN 1584-384X;
7. *Carmen Holotescu*, Gabriela Grosseck. (2008). *Posibilităţi de utilizare a sistemelor de microblogging în educaţie*. Studia Universitatis Vasile Goldiş Arad, 2007, pg,46-54, vol 17, cod CNCIS 438 (cat. C). ISSN: 1584-2355;
8. *Carmen Holotescu*, Gabriela Grosseck. (2009). *Multimedia si microblogging prin cirip.ro*. International Conference „Directii si strategii moderne de formare si perfectionare in domeniul resurselor umane", Bucuresti, 21 nov. 2009, DPPD, University Politehnica Bucuresti, ISSN 2067 – 1024;
9. Gabriela Grosseck, *Carmen Holotescu*. (2009). *Romanian Micro-Social Media Platform. A Study Case for cirip.ro.* Journal of Social Informatics no. 12/dec 2009, ISSN 1584-384X;
10. Teodor Todinca, Alina Dumitrel, *Carmen Holotescu*. (2009). *Software tools for the modelling and simualtion of biomass gasification processes*. Volum Zilele Academice Timisene;
11. Gabriela Grosseck, *Carmen Holotescu*. (2010). *Microblogul ca interfaţă a interacţiunilor sociale. Studiu de caz: Revoluţia din 1989*. In volume Conferinta anuală a cercetării sociologice si de asistentă socială, 2010, Bucuresti, Facultatea de Sociologie si Asistenţă;
12. *Carmen Holotescu*, Gabriela Grosseck, Ramona Bran, Dorina Gutu. (2010). *The Influence Of Communication In 140 Characters On Romanian Presidential Elections*. Revista de Informatica Sociala nr. 13 /dec. 2010, pag. 31-42, ISSN 1584-384X;

b. Books/Chapters

1. *Carmen Holotescu*. (2004). *eLearning Guide*. Solness Timisoara, 2004;
2. *Carmen Holotescu*, Antoanela Naaji. (2007). *Tehnologii Web*. Vasile Goldis University Press, Arad, 2007;
3. Anita Pincas*, Carmen Holotescu*, Elisa Manzi. (2007). *Guidelines for e-tutors*. Published in the „ELF - E-Learning Facilitators: analyses of their different roles within different methodologies and approaches" Project, 2007;
4. Gabriela Grosseck, *Carmen Holotescu*. (2011). *Social Media Challenges for Academia*. Chapter in the book "Contemporary Issues in Education and Social Communication", Martin Meidenbauer Verlagsbuchhandlung, München, ISBN ISBN 978-3-86924-156-2 – 2011;
5. Felicia Banu, *Carmen Holotescu*, Gabriela Grosseck, Igor Sevcenco. (2011). *Evaluarea calitatii predarii si invatarii in invatamantul superior*. Tipografia Centrografic, Chisinau, Moldova, ISBN 978-9975-914-70-3 – 2011;
6. *Carmen Holotescu*, Gabriela Grosseck. (2012). *Microblogging in Education*. Chapter in the book "Global Elearning" published by Madrid Open University – 2012, ISBN 978-84-454-2218-2;
7. *Carmen Holotescu*, Gabriela Grosseck. (2012). *Scenarios for integrating Social Media in Education*. Chapter in the book "Global Elearning" published by Madrid Open University – 2012, ISBN 978-84-454-2218-2;
8. *Carmen Holotescu*, Gabriela Grosseck. (2012). *Learning from the stream*. Chapter in the book "Global Elearning" published by Madrid Open University

– 2012, ISBN 978-84-454-2218-2;

9. Gabriela Grosseck, *Carmen Holotescu*, Bogdan Patrut. (2013). *Academic Perspectives on Microblogging*. Chapter in the book "Social Media and the New Academic Environment: Pedagogical Challenges", IGI Global Publishing House USA – 2013;
10. *Carmen Holotescu*, Vladimir Crețu. (2013). *Microblogging Platforms in Education: Features, Usages and Arhitectures*. In "Microblogging in Educational Settings. How Microblogging Platforms can be used in Formal and Informal Education". Editors: *Carmen Holotescu*, Gabriela Grosseck, Antonio Calvani, Filippo Bruni; AVM – Akademische Verlagsgemeinschaft München 2013 © Thomas Martin Verlagsgesellschaft, München, ISBN: 978-3-86924-498-3, http://www.amazon.de/Microblogging-Educational-Settings-Platforms-Education/dp/3869244984;
11. *Carmen Holotescu*, Gabriela Grosseck. (2013). *Cirip.eu – An Educational Mobile Multimedia Microblogging Platform*. In "Microblogging in Educational Settings. How Microblogging Platforms can be used in Formal and Informal Education". Editors: *Carmen Holotescu*, Gabriela Grosseck, Antonio Calvani, Filippo Bruni; AVM – Akademische Verlagsgemeinschaft München 2013 © Thomas Martin Verlagsgesellschaft, München, ISBN: 978-3-86924-498-3, http://www.amazon.de/Microblogging-Educational-Settings-Platforms-Education/dp/3869244984;
12. Gabriela Grosseck, *Carmen Holotescu*. (2013a). *Scholarly Digital Curation in 140 Characters*. In "Applied Social Sciences: Education Sciences". Book printed by Cambridge Scholars Publishing http://www.amazon.de/Applied-Social-Sciences-Education/dp/144384246X;
13. *Carmen Holotescu*, Gabriela Grosseck. (2014). *Evaluare 2.0: abordări conceptuale*. In „Repere orientative în evaluare". Editura de Vest, 2014;
14. Antoanela Naaji, Anca Mustea, *Carmen Holotescu*, Cosmin Herman. (2015). How to Mix the Ingredients for a Blended Course Recipe. In "Social Media and Open Education". Editors: Bogdan Patrut, *Carmen Holotescu*, Gabriela Grosseck, Diana Andone. Springer.

c. Research studies/Reports

1. *Carmen Holotescu*, Jane Knight. (2002a). *Online Communities - eWorkshop Notes*. eLearning eJournal;
2. *Carmen Holotescu*, Jane Knight (2002b). *Methodologies in e-Learning - eWorkshop Notes*. eLearning eJournal;
3. *Carmen Holotescu*. (2007). *Technical Requirements for Educational Software*. Report in the Knowledge Economy Project;
4. Seppo Tella, *Carmen Holotescu.* (2007). *Analysis of the current situation of the use of ICT in Romanian schools. Recommandations*. Report in the Knowledge Economy Project;
5. *Carmen Holotescu*, Gabriela Grosseck. (2007). *Using Web2.0 Technologies in Blended Courses*. Report in the "OBELFA: Open BlendEd Learning For Adults" Project;
6. *Carmen Holotescu*. (2007). *Handbook for training E-tutors trainers*. Published in the „ELF - E-Learning Facilitators: analyses of their different roles within different methodologies and approaches" Project;
7. *Carmen Holotescu*, Cristian Manafu. (2007-2009). *O analiza a blogosferei romanesti bazata pe RoBloggers Survey*. eLearning eJournal;
8. *Carmen Holotescu*. (2012, updated in 2014*). Open Educational Resources in*

Romania. Report in the "POERUP: Policies for OER Uptake", EU Lifelong Learning Programme Project. http://poerup.referata.com/wiki/Romania;

9. Valentina Pavel Burloiu, Teodor Chirvase, Bogdan Manolea, Ovidiu Voicu, Andra Bucur, Nicolaie Constantinescu, *Carmen Holotescu*. (2014). Ghid de bune practici Resurse Educaționale Deschise (RED). Creative Commons Affiliate Projects 2013.

d. Projects

1. *Career Orientation and Counseling*; Phare Project, 2003; Coordinator: Center Education 2000+ Bucharest, Romania ; Role: *Partner*;
2. *eLearning for Managers*; Phare Project, 2003-2004; Coordinator: Expert Consulting SRL, Timisoara, Romania; Role: *Partner*;
3. *Superconductivity Multimedia Educational Tool phase 2 for the continuing vocational training of upper secondary school physics teachers*; Leonardo da Vinci, N/04/B/PP/165.008, 2004-2007; Coordinator: Simplicatus, Norway; Role: *National Coordinator*;
4. *Defeminization of Poverty: The Balkans/Asia Minor E-Entrepreneur Development Project*; Leonardo da Vinci, TR/05/B/F/PP/178.057, 2005-2007; Coordinator: Kavrakoglu Consulting and Training, Turkey; Role: *National Coordinator*;
5. *OBELFA: Open BlendEd Learning For Adults*; Grundtvig I, 225880 - CP -1-2005-1- TR - GRUNDTVIG - G1PP, 2005-2007; Coordinator: Ankara University, Cankiri College, Turkey; Role: *National Coordinator*;
6. *ELF - E-Learning Facilitators: analyses of their different roles within different methodologies and approaches*; Leonardo da Vinci I/05/B/F/PP-154178, 2005-2007; Coordinator: Dipartimento di Filosofia "A. Aliotta" Università degli Studi di Napoli, Italy; Role: *National Coordinator*;
7. *HeLPS. - High e-Learning Professional Skills*; Leonardo da VinciI/04/B/F/PP-154112, 2005-2007; Coordinator: Istituto Tecnico Industriale F.Giordani, Napoli, Italy; Role: *Consultant*;
8. *Development of Education Policy Concerning the Integration of Information Technology and Communications in the Pre-University Romanian Education System*; Knowledge Economy Project, 2007; Coordinator: Finnish Consulting Group, Finland; Role: *Consultant*;
9. *3L Welfare: Lifelong Learning & Welfare Policies, good practices and innovative processes for training, guidance, employment and social inclusion: comparing the Danish, French, Spanish and Italian experiences*; Programme of Government of the Province of Naples, 2007-2009; Coordinator: Dipartimento di Filosofia "A. Aliotta" Università degli Studi di Napoli, Italy; Role: *National Coordinator*;
10. *WETEN - Western-Eastern Teacher Education Network*; TEMPUS Project, 2009-2011; Coordinator: Kaunas University of Technology, Lithuania; Role: *National Coordinator*;
11. *UNIQUE Integration of particulate abatement, removal of trace elements and tar reforming in one biomass steam gasification reactor yielding high purity syngas for efficient CHP and power plants*; FP7 Project, 2008-2011; Coordinator: University of L'Aquila, Italy; Role: *Researcher*;
12. *DidaTEC: University school for initial and continuos training of teaching staff in technical and engineering domains*; POS-DRU AP 1, 2010-2013; Coordinator: Technical University of Cluj-Napoca, Romania; Role: *Expert*;
13. *Estart: Master Program in eActivities*; POSDRU/86/1.2/S/54956, 2012-2013;

Coordinator: Technical University of Cluj-Napoca, Romania; Role: *Course Tutor*;

14. *SUTRA: SUpporting TRAiners working with people with mental/cognitive difficulties*; GRU-11-P-LP-28-TM-IT, 2011-2013; Coordinator: Dipartimento di Filosofia "A. Aliotta" Università degli Studi di Napoli, Italy; Role: *National Coordinator*;
15. *IN-SIGHT: INformal learning pathways for supporting elder to see beyond SIGHT*; GRU-12-P-LP-163-TM-IT; 2012-2014; Coordinator: Associazione U.N.I.Vo.C. di Napoli, Italy; Role: *National Coordinator*;
16. *VIP: Vocational training In Prison*; GRU-12-P-LP-9-TM-IT; 2012-2014; Coordinator: Cooperative Lazzarelle, Napoli, Italy; Role: *Researcher*;
17. *POERUP: Policies for Open Educational Resources Uptake*; Lifelong Learning Programme under Key Activity 3 ICT; 2011-2014; Coordinator: Sero Consulting Ltd, London, UK; Role: *Consultant*.

e. Citations

Over 600 citations: indexed by Google Scholar at http://scholar.google.com/citations?user=CoMEtL4AAAAJ&hl=en.

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Can we use Twitter for educational activities G Grosseck, C Holotescu 4th International Scientific Conference, eLearning and Software for ...	263	2008
Using microblogging in education. Case Study: Cirip.ro C Holotescu, G Grosseck 6th International Conference on e-Learning Applications, Cairo; http://www ...	39 *	2009
Microblogging multimedia-based teaching methods best practices with Cirip. eu G Grosseck, C Holotescu Procedia-Social and Behavioral Sciences 2 (2), 2151-2155	32	2010
Learning to microblog and microblogging to learn. A case study on learning scenarios in a microblogging context C HOLOTESCU, G GROSSECK The 6th International Scientific Conference eLearning and Software for ...	30	2010
Using microblogging to deliver online courses. Case-study: Cirip. ro C Holotescu, G Grosseck Procedia-Social and Behavioral Sciences 1 (1), 495-501	29	2009
Indicators for the analysis of learning and practice communities from the perspective of microblogging as a provocative sociolect in virtual space G Grosseck, C Holotescu 5th International Scientific Conference eLSE-eLearning and Software for ...	24 *	2009
Using microblogging for collaborative learning C Holotescu, G Grosseck Proc. the New Technology Platforms for Learning–Revisited, Budapest, Hungary ...	24	2009
Mobile learning through microblogging C Holotescu, G Grosseck Procedia-Social and Behavioral Sciences 15, 4-8	23	2011
Ghid eLearning C Holotescu Solness, Timisoara	18	2004
Teacher education in 140 characters-microblogging implications for continuous education, training, learning and personal development G Grosseck, C Holotescu Procedia-Social and Behavioral Sciences 11, 160-164	14	2011
An empirical analysis of the educational effects of Social Media in universities and colleges C Holotescu, G Grosseck Conference proceedings of "eLearning and Software for Education"	12 *	2012