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DESIGNING AN EFFECTIVE AND SCIENTIFICALLY GROUNDED E-LEARNING ENVIRONMENT FOR INITIAL TEACHER EDUCATION: THE ITALIAN UNIVERSITY LINE MODEL

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Online didactics for adults has to meet the needs of an audience with peculiar constraints and goals. In particular, within a constructivist and connectionist perspective, it has to ensure the right balance between autonomy and socialization, while stimulating reflection upon experience and generating further meaningful experiences.
In this contribution we present the educational model of the Italian University Line as an example of online didactics meeting the above defined requirements, also in the case of ITE – Initial Teacher Education.
Finally, we present an ongoing experimentation of gamification, aiming at enhancing engagement and motivation.

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1 Introduction

Over the last few decades, the world has changed almost unrecognisably, and this has had a big impact on people's lives and careers. Nowadays, in a world that is more global, when technologies are rapidly changing, and dynamic new generations are constantly progressing, even five years is a long time in a single job. More importantly, the typical "static" professional, who built his/her knowledge once for all, does not exist anymore. Everyone needs to continuously update their skillset in order to keep up with change and transformation. That's why we talk about lifelong learning, at least since Delors' (1996) definition of the four 'pillars' of education for the future.

Lifelong learning is therefore a common concern, especially for the teachers who have simultaneously to face up to technology evolution, knowledge growth and the new generations.

Teachers are therefore peculiar lifelong learners: they are at the forefront in facing change and ever-changing needs, coming from society and the labour market, and they consequently have to be able to innovate and adapt to different students and contexts.

Constant learning is therefore a priority for them, also because they are reflective practitioners (Schön, 1983), whose practice involves a willingness to actively participate in a perpetual growing process, requiring ongoing critical reflection on both classroom practices and core beliefs (Larrivee, 2008). Furthermore, their daily confrontation with the class acts as a continuous assessment of their work, opening spaces for critical thinking and improvement.

If, on one hand, learning is a never-ending process, on the other hand, there are some phases that are more critical and strategic than others.

For teachers, "initial education is the first crucial stage in a teacher's professional journey. It lays the foundations of a professional mindset and provides the new teacher with a basic toolbox to make meaningful learning happen in the classroom" (ET2020 Working Group on School Policy, 2014).

They need an effective and scientifically well-grounded learning environment. "Scientifically grounded" means that the learning offered complies not only with the principles of andragogy (Knowles, 1975) but goes even beyond, leaving the right space to self-determination and adopting a heutagogical approach. Heutagogy was defined by Hase and Kenyon in 2000 as the study of self-determined learning. It applies a holistic approach to developing learner capabilities, with learning as an active and proactive process, and learners serving as "the major agent in their own learning, which occurs as a result of personal experiences" (Hase & Kenyon, 2007: 112). Heutagogy is of special interest to distance education: specifically, heutagogy "has the potential to become a theory of distance education, in part due to

the ways in which heutagogy further extends the andragogical approach and also due to the affordances it offers when applied to emerging technologies in distance education" (Blaschke, 2012).

Within this scenario, the purpose of this article is two-fold: firstly, it presents the online IUL (Italian University Line - www.iuline.it) educational model, as the ideal model for teacher education and initial education in particular; secondly, it offers insights into possible developments, especially in the direction of gamification as a strategic way to support learners' motivation and engagement.

2 Social constructivism and online interaction

The debate on how to implement social constructivism (Vygotsky 1978) in e-learning is not new. It has developed in parallel with the growth of online learning environments, mainly for academic use. "The problem is how to interpret the socio-cultural paradigm and how to update it. All too often, the wrong instructional design of the learning environment produces operating procedures which are theoretically stigmatised and the technology in use is blamed for the rigidity of the structure, without focusing on inadequate planning" (Rossi, 2006: 77, transl. by the author).

Before describing how the model can put into practice the constructivist principles, we wish to illustrate how to determine if an online environment satisfies its fundamental principles. The model of "Community of Inquiry"[1] developed already in 2000 by Garrison, Anderson and Archer is made up of three key elements which should be included in every online learning environment, based on the constructivist and constructionist models. These elements are: the cognitive element, the social element and the teaching element.

The cognitive element is at the core of the online learning environment and is made up of the learning contents.

The teaching element, also in the function of facilitator, is necessary to guide and direct learning. One of its main characteristics is versatility and the ability to adapt to students' needs.

According to Mbati (2012), who reviewed the main contributions to this debate in the last two decades, an online learner should not only be provided with chances for socialisation, by the environment, but he/she should also make efforts in order to be perceived as a "real" social

[1] The concept of community of enquiry was introduced long time ago (end of 1800) by the pragmatic philosophers Peirce e Dewey, but here refers to the application of this concept in online environments.

presence. Garrison *et al.* (2000: 94) already mentioned, and also Peterson and Caverly (2005: 38), define the social presence as the ability of the learner "to project themselves socially and emotionally, as real people (i.e. their full personality), through the medium of communication being used" (Mbati, 2012, 103).

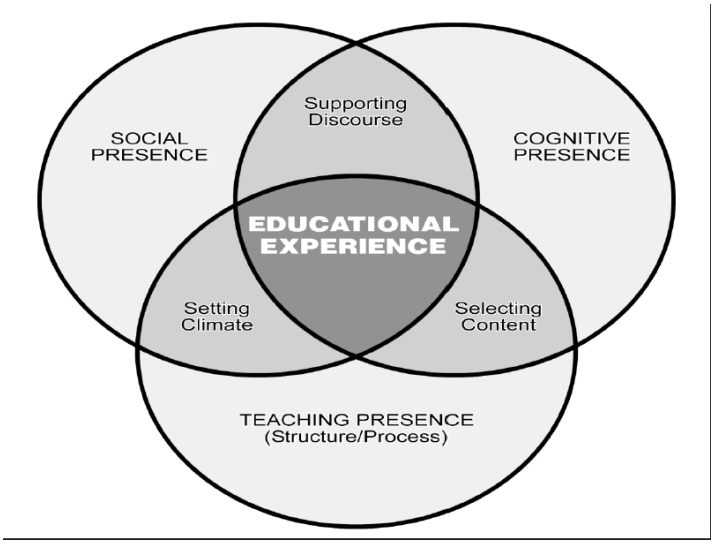

Fig. 1 - Model of community inquiry adapted by Garrison, Anderson and Archer (2000)

This implies that the online learner holds the capacity to socialise in the new environment. Some scholars, Mbati (2012) emphasises, consider this a relevant problem because the lack of this capacity "may lead to learner frustration, anxiety and, ultimately, failure with online learning" (Kehrwald, 2008: 97). However, as far as this aspect is concerned, direct action cannot be taken. What can be done is to provide the learner with adequate opportunities to express his/her social presence.

We are therefore going to describe the model starting from the general setting of the environment and dividing it into three main functional areas: welcome area, didactic area (campus) and library.

The welcome area is designed to welcome the student and help him/her in the quest for information. The sections must be organised with a user friendly approach enabling easy and intuitive access to contents.

3 The educational model

3.1 The environment

3.1.1 Welcome area

The portal is structured to facilitate the access to practical information. A drop-down menu lead to the presentation of the university, the educational provision, the student service office, contacts and press office. The news section provides updates and developments of the courses. Additional materials, such as activities prepared by the teachers or the students' final thesis, the profiles of the staff and the ex-students' success stories are accessible by registering as a guest and obtaining a profile where the student service office can send information regarding the courses activated and events of the University. Registered users can, in this way, visit some of the online environments as guests, in order to gain an insight into the contents and the organisation of the university. Upon enrolment, students can access the didactic area.

3.1.2 The didactic area – the Campus

The campus is the place where students attend lessons, access the library, interact with the student service office, create groups of study or study individually. In the orientation area, the student can interact with the student service office, disciplinary and path tutors, consult the guidelines, watch tutorials for the navigation of the online environment and report any disservice.

The areas of the university dedicated to socialisation and study are: the library, the scriptorium, the lecture hall, the students' rooms and non-moderated forums for discussion. The lecture hall and the students' room allow synchronous group web conferencing. The university is therefore organised to favour personalisation of the training pathway, socialisation of the learning experience and co-production of knowledge. The student's personal profile keeps record of the activities carried out during the course and also of individual study, materials consulted and the reports produced. This is not only an automatic digital diary, useful to trace student's development, but also a useful support for the personalisation of the learning experience.

3.1.3 The Library

The library is conceived as a study environment and at the same time as a place for the production of knowledge. All the texts found in the library can be annotated, commented, edited and correlated to other documents, so that a new version of them can be created at any time. Thanks to the editing, traceability and reading feedback functions of the scriptorium, the texts become real places

of interaction. This area is used for the editing and production of contents and associates a text editor with tools for creating maps, for annotating images, for creating tests and surveys and other applications for creating multimedia content. All teachers and students have the opportunity to create their own work-study space by inserting the texts, useful to their study, in a dedicated "shelf". The shelf is a private space for the elaboration of the work in progress or for the reflection on the texts chosen, through all the tools made available by the synergic use of the library and the scriptorium. It is also a place to share one's work with the rest of the University. The option to insert a text (chosen among those available or personally created) in the public or private part of the shelf responds to the principle of co-construction of knowledge, as it allows individual reflection and sharing, comparison and growth, through the interaction with the rest of the community.

3.2 Key Figures/functions

The model we are describing is a digital learning environment for tertiary education. In this virtual environment, organised in the function areas described above, some Key Figures/functions operate: the student, the teacher and the tutor.

The central role of the student within the teaching-learning process is a key assumption of the constructivist approach. It must be considered that students are adults and each of them has different needs, therefore it isn't easy to develop personalised curricula tailored for each of them.

However, the technological infrastructure can provide the tools to collect all the relevant information about the student and develop his / her profile, in order to identify his/her training needs. This activity is strategic, in general, to implement the principle of personalisation of learning, and, in particular, during the orientation process. In this perspective, the technological infrastructure allows to collect and organise the data about the student, elaborating a personal profile in order to lay out the individual training agreement.

3.2.1 The Student

The student is at the core of the learning experience. This aim is achieved through a personalised path and through a continuous and active dialogue with all the other actors involved in the process (teachers, tutors, university staff, etc.) and with the other students. For this reason, gathering information on the student's profile and tracing the activities he/she has carried out, make it possible to have a complete picture of his/her training needs and of the results achieved. The digital profile of the student provides, in addition to his/her

personal data, information on the materials consulted and produced, and the type of presence in the environment. This information and the user status are functional to the communication on the platform and can be managed by the user. A similar function is that of the notice board, a virtual area where it is possible to insert and share information or reports of common interest.

The problem of the possible isolation of the "inhabitants" of the online environment can be solved, as well as with the arrangement of spaces and functions for virtual socialisation, with the organisation of in person meetings. These meetings can have various functions: from knowing each other and socialise, to peer support and preparation of exams together. The notice board and the status are the basic elements showing the presence of the student in the environment and can be made visible to the users connected with the student (classmates), to the teachers, to the course colleagues or to the whole community of users. The presence in the environment is essential for starting conversations in the online environment.

The training diary is used to lay down the training agreement and to set the base for a path of reflection in view of the thesis project. The diary is based on a personal blog to be compiled periodically by the students guided by the tutors and the teachers. The blog is designed to be accessible to teachers and path tutors, strategic figures for the definition of individualised paths. Students must decide whether to make the posts public to other users of the platform.

As a further tool for customising the course, the portfolio reports the students' assessment results achieved in the tests and in the course and lessons activities. The class performance statistics can also be accessed from the portfolio: this information can be useful for self-assessment. The portfolio contains the diary of online activities, where each student can check his/her situation regarding the actions tracked by the system (downloaded materials, reports sent at the conclusion of self-learning activities, participation in synchronous events, interventions in class forums, categorised by author, form, sub-form and date).

In accordance with the constructivist approach, the teacher, the tutor and the path tutor stimulate and orientate the student, contributing to create the "favourable contexts" mentioned by Wenger: "Education doesn't make learning happen, it creates the context where learning happens, as it does in other contexts" (Wenger, 2006: 266).

The path tutor's figure might be less clear of that of the teaching tutor. This is a multifunctional figure combining teaching and administrative functions. The path tutor has, in fact, a connection function between the teaching and the administrative systems, the infrastructure and the outside world. As far as this last aspect is concerned, the path tutor creates, together with the student, the connection with the outside world, that is, the world of work and other training opportunities. This is achieved through orientation, skills assessment, problem

based learning or reworking. The path tutor, being a supporter and a facilitator, becomes the student's coach and face to face meetings can also be scheduled.

3.2.2 The Teacher

The teacher provides a theoretical framework for teaching, in agreement with the tutor, and organises some synchronous events (recorded video lessons or synchronous lessons). The teacher's task is to produce study materials for online use, to indicate possible recommended readings and reference webliographies, to prepare midcourse tests, together with the tutor, to participate in the exams and to communicate the results to the student service office.

3.2.3 The Teaching Tutor

The teaching tutor is a central figure who possess disciplinary, communicative and organisational skills. The tutor supports the teacher, taking care of the organisation and development of teaching activities. The tutor takes care of the design and planning of teaching activities and publishes in a dedicated space the initial studying materials, in accordance with the educational objectives set by the teacher.

The teaching tutor, using the communication tools made available by the environment (chat, forum, synchronous activities), provides the students with the guidelines of the course, offers food for thought, animates the online debate and clarifies perplexities. In this sense, the tutor is a reference figure for the management of the training-communication process. In particular, as regards the asynchronous activity, the tutor initiates, stimulates and moderates the exchange between students on the teaching content, making available, when appropriate, additional resources based on the students' requests for personalisation of the module. In this sense, his/her task is also to report these requests and any other significant element to the teacher, so that the path of personalisation is properly structured and deepened.

3.2.4 The Path Tutor

The path tutor is a methodologist, in some cases, replacing the teaching tutor, other times collaborating with him/her. The path tutor introduces the students to the online environment during a dedicated module and along the entire educational path. He/she facilitates the interaction between the students and the learning/communicative environment. Therefore, the path tutor possesses strong knowledge of the online learning environment and learning methods. He/she liaises with the student service office, the data centre and with teaching tutors for whom he/she also manages and addresses students' questions

and information requests. Moreover, the path tutor takes care of guest users through the mailing lists and student forums, and analyses, with the student service office, the personal data provided by the students in order to trace the students' profiles.

3.3 The Didactic area

This section describes the organisation and the functioning of the didactic area of the didactic model we have proposed. In particular, we are taking into account the educational path of A.Y. 2017-2018 issuing 24 ECTS in Anthropo-Psychological disciplines and methods and technologies for didactics, which according to the present Italian regulation are access requirements to sit the public exam to qualify as upper and secondary school teachers (art. 5 legislative decree n.59 of 13 April 2017). Therefore, this course is a brief course for teachers' initial training.

Table 1
STRUCTURE OF THE IUL 24 ECTS CREDITS COURSE

Subject		SDS	ETCS	Delivery mode
Subject 1	E-learning and pedagogy 2.0	E-PED/04 Experimental pedagogy	6	online
Subject 2	Psychology of development thinking and creativity	M-PSI/04 - psychology of learning	6	in person
Subject 3	Ethical responsibilities of the teacher	M-FIL/03 - Moral philosophy	6	online
Subject 4	Techniques and technologies for school learning	M-PED/03 - Didactics and special pedagogy	6	in person
TOTAL ECTS			24	

The orientation phase of the course includes welcoming and orientation of students. Using Lowen's metaphor (1994) we could call it the "grounding phase", that is, settling in the environment in order to be able to explore it and make the most of all the educational opportunities it offers. During this phase, after orientation and self-assessment, the student and the tutor lay out the educational agreement. In the case of the 24 ECTS course, the orientation is reduced, due to the brief duration of the course (three months), but it still holds a key function.

3.3.1 Orientation

The orientation phase accompanies the first steps of the student in

the online environment, which welcomes him/her offering a series of services. The aim is to allow the student to familiarise with the environment and the tools, get to know the educational model, the course organisation and the functioning of the online community. Familiarising with the environment means also getting to know the aims of the courses and verify possession of the requirements. Whenever the student lacks core competences or knowledge, these can be acquired in this phase by laying out with the tutor a personalised study path to be completed before the beginning of the course.

After the initial settling in phase, the student possess the instruments to go on along his/her learning path. However, the online environment is a particular one: it is more difficult to interpret and experience but also more full of stimulations and opportunities. It is a highly permeable learning environment because it interacts with the non-digital one, enhancing its possibilities. In this regard, it is a breaking point for the milestones of the pedagogical and andragogical settings, also for advanced ones, such as the constructivist. In fact, on one hand, it redefines the borders of social interaction, pushing the inhabitants of digital environments towards new types of socialisation. On the other hand, it makes visible the epistemological status of technology: extreme fragmentation of knowledge and its distribution in small and big packs of data, dots or knots of the network.

In a time when knowledge is growing exponentially and is not owned by just a few individuals, learning has drastically changed. In the connectivist perspective, learning is a no-linear process dominated by chaos, complexity and self-organisation. Among the core principles of the connectivist approach (Siemens, 2004) there are beliefs such as: "Capacity to know more is more critical than what is currently known"; "Nurturing and maintaining connections is needed to facilitate continual learning"; and "The ability to see connections between fields, ideas, and concepts is a core skill".

The environment we envisage is a balanced combination of traditional and innovative elements enabled by "digitality". Therefore, in the digital environment not only the course contents can be learnt and qualifications achieved, but also higher and more complex functions - defined by connectivism as crucial for the citizen living in an hybrid world where the border between digital and non-digital is becoming increasingly thin - can be exerted. In particular, what is at stake is the ability to learn, which the EU Commission has included among the key competences of lifelong learning. Thus, the student is fully equipped to learn all hi/she

needs, in a an active and innovative way. The student is responsible for making the most of the resources at disposal. He/she must be willing to make use of these resources, and it is significant that in the connectivist perspective this is not a minor step: decision-making is in itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision. For this reason, Heutagogy can be described as "progression from pedagogy to andragogy to self-regulation, with learners likewise progressing in maturity and autonomy" (Canning, 2010).

Conclusions: the quest-based experimentation

So far, we have described the IUL structural and organizational model, and provided a concrete example of ITE – Initial Teacher Education. The first edition of the course, which is a short special-purpose pathway, wasn't provided with tools to measure the impact on learners. However, in the next edition of the course we intend to provide evaluation tools.

Nevertheless, our 24 ECTS course has been attended by 120 people and has been truly appreciated as it was shown by spontaneous feedbacks (i.e. emails to tutors and teachers, contributions to the fora, informal face-to-face interactions with tutors and teachers). An indirect quantitative indicator of appreciation was the fact that, after the completion of the 24 ECTS course, more than half the participants (70 people) enrolled in one of the two I level professional master programmes available in the same disciplines: "Education & Training: Pedagogy 2.0" and Didactic, anthropological, psycho-pedagogical methods and economical-legal aspects".

We have highlighted how the IUL educational model meets the apparently conflicting needs of socialisation and autonomy of an adult and busy audience, by offering an andragogical and heutagogical approach. Therefore, in a nutshell, taking up the proposal of Canţer 2012, and assuming heutagogy as the evolution of andragogy (Canning, 2010), we could call it an e-heutagogycal model.

We finally outline the ongoing improvement process, aiming at having a positive impact on a key factor of adult education: motivation. This is a gamification process (Uhr *et al.*, 2015) focused on the quest mechanism, consisting of searching for (learning) objects such as key terms, images or schemes, following the instructions of a "superior" (the path tutor) and solving problems (riddles, enigmas) based on learning contents.

The guiding principle is the Incremental Progression (Oxford Analitica, 2016, Kapp, 2013), i.e. the notion of Proximal Development Zone applied to gamified e-learning.

Building on the encouragement of incremental progression, the quest incorporates badges as visible symbols of achievement, also providing more intermediate goals and thus keeping the interest high. Badges enrich the learner's portfolio and are part of assessment.

With this experimentation, we aim at improving the quality of our educational offer, by providing highly engaging, relevant e-learning environments, where socialisation and autonomy are both fully ensured and the key principles of ITE, according to the latest EU Commission guidelines, are fully respected. In particular, the inquiry-based approach we are currently developing within the gamification process is in compliance with ITE: "3. Teachers should be able to develop and maintain a mind-set and a practical approach which are based on reflection and inquiry, and focused on ongoing professional development".

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