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**Connecting through Educational
Technology**

to produce effective learning environments

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Introduction

Connecting through Educational Technology – to produce Effective Learning Environments

Technology is with us everywhere which validates the horizontal-holistic approach for imperative questions of the period. For the transforming education landscape, challenges come increasingly from the socio-cultural-economic, structural and policy fields. Education has to be visionary to reach efficiency gains, new sources – and to offer sustainable services, reflecting the complexity of modern societies.

Market realities put similar pressures on the corporate and University worlds. Stakeholders expect academia to respond to needs beyond teaching and research, better promote innovation and the knowledge economy, manage the new student populations. Universities are expected to detect and attract talents, be magnet of inputs from practitioners, resulting cooperative surplus.

Vocationalisation of education also means the emergence of new skill sets. The progress in industrial automation and ICTs opens possibilities for lifelong learning resources, for work based learning and integration of human-machine intelligence models.

Educational technologies are about connections among information, knowledge, action, emotion and value: knowledge construction, learning activities by sharing and thinking, interactivity, aggregative mechanisms, cooperation and integration – to meet the requirements of the knowledge age, to satisfy the needs of social transformation and learning innovation.

New generation of learning technologies and networks are ubiquitous, embedded and mobile which reshape access to and delivery of learning. Cutting edge fields are artificial intelligence, learning analytics, micro-learning, new credentialing, revolution of assessment, massive open online courses (MOOCs), personalized learning, game-based learning, flipped classroom, Digital Makerspaces and alike.

The questions remain: Which one(s) of these will have significant and sustained impact in the future? Can the network society become an enhanced learning society? How can information and communication technology in the age of Industry 4.0 create and enhance synergies between online learning programmes, the increased diversity of stakeholders, the workplace experience, socio-cultural influences and students' work-life balance?

EDEN is pleased to welcome again at its 2019 Annual Conference the scholars, practitioners, experts from Europe and all around the world in Bruges to discuss the issues of Connecting through Educational Technology.

Major themes of the Conference included:

- *Global connections*: How to organise online study programmes that enhance the students' competences, provide connections with international partners and promote virtual mobility?
- *Connections with workplace*: How can innovative study programmes be developed to involve the workplace impact and experience (virtual dual learning, (distance/digital) internships)?
- *Connections with the community*: How to organise study programmes that focus on relations of curriculum, delivery and the socio-economic environment?
- *Connection with learners*: Caring about the work-life balance of the students, attentive to learners' needs, expectations and the changing behaviour of diverse student populations.

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THE INTERNATIONALIZATION OF THE XXI CENTURY UNIVERSITIES: UNINETTUNO MODEL

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The Internationalization of the Universities: A Historical Overview

Universities were born as supranational institutions. Earlier, the first cultural centres, named universities by the scholars of the Arab World, such as the al-Qarawiyyin University, or the al-Karaouine University, based in Fes, Morocco, founded in 859 by a woman, Fatima Al-Fihriya, and followed, in a chronological order, by the al-Azhar University, Cairo, Egypt, founded in 975, played an important role in the cultural relationships between the Islamic World and Europe. The texts of the ancient Greeks, from Aristotle to Hippocrates, from Galenus to Euclides up to Ptolemy, were translated in Arabic, and studied and commented by the Arabic intellectuals. At the beginning of the Middle Ages, Europe received from Arab culture more than it would be able to give. From the 12th century on, the path was traversed backwards. Latin intellectuals moved to Barcelona, Toledo, Sevilla, and in Sicily, where they found the aforementioned texts and translated them into Latin, allowing Arab culture ideas and knowledge, elaborated on the basis of Greco-Roman civilization ideas, to penetrate the European intellectual circuit. Along with those texts, there came also the works by the Arab commentators to Aristotle, like Avicenna, which were commented and studied at the new-born Universities. In Europe, universities were born as corporations of teachers and students (Prodi, 2013); the first one in 1088 was the University of Bologna and soon after, there were the Sorbonne University in Paris, the University of Salamanca in Spain and the Oxford University in England.

For centuries, schoolmasters and students, moving from own town to the other, from Bologna to Paris, from Paris to Oxford, from Oxford to Salamanca, have produced and spread knowledge, promoted the development of new ideas, keeping Europe's spiritual unity always alive; they developed a culture without boundaries. In the Middle Ages each University was a separated entity and all together they made up a European supranational network of students, teachers and knowledge.

In the Middle Ages all universities were open to people of any nationality and students, in the various sites, gathered into corporations. Young people felt that, in order to get a valuable intellectual and scientific education, they needed to attend several universities and, for this reason, they moved from one institution to another, facing exhausting journeys on foot or on horseback. Students who aimed at acquiring a good training in law attended the University of Bologna, for theology and philosophy they went to Paris and to attend courses on sciences and mathematics they moved to Oxford. Besides their interest in the discipline, what attracted the

students most was the scholars' reputation. There were the most famous scholars such as Saint Thomas Aquinas, who taught philosophy and theology at the University of Paris where he was considered as a kind of "guru", a university "star" and for this reason his courses were requested also by other universities. Saint Thomas moved from Paris to Salamanca to deliver his lectures on Aristotle's theories, followed by a lot of students, animating the intellectual life of the time with his ideas on the relationship between faith and reason as well as on the question of free or paying access to the university studies which inspired debate between Dominicans and Franciscans (Garito, 1983). The relatively few universities of the medieval era were sufficient to weave the plot of a unitary, strong and coherent culture that soon became a common heritage of Europe.

Between the 15th and the 16th century, with the Renaissance, universities changed their juridical and administrative model: from corporations they became foundations, from private organizations public institutions, from supranational bodies they changed into national structures, from expression of pluralism of different classes they became expression of selected social groups. The universities changed their roles and functions. Princes who gave them prestigious premises and material assets funded them but, in change, Universities bowed to the needs of power and, therefore, partly lost their autonomy and freedom, fast surrendering to public powers in juridical as well as in economic terms (see Hammerstein, 1995).

The universities' international character began to fade away and give way to their nationalization and regionalization. Universities had the well-defined task to train officers, magistrates, diplomats, as well as the whole staff that would make up the ruling class of the States (Boehm & Raimondi, 1981).

It would take many years before significant internationalization models of the universities emerge.

Nowadays, the 21st century is actually emerging as the century in which new models of university internationalization become real, thanks to the use of the new technologies. Exploiting the potential of the Internet, in fact, it is easy to build networks of universities based in different countries of the world, which jointly disseminate knowledge without boundaries of space, time and place.

The Internet: New models of internationalization – Universities without Boundaries

Nowadays a most significant historical turning-point is under way; everyone is the protagonist and spectator of a cultural revolution fuelled, driven by technologies able to affect the processes of our minds and connect them on a global and planetary scale.

In a few years, the Internet has become the most powerful platform across the world; it connects intelligences and allows people, belonging to countries that are different in terms of history, culture, religion and economy, to take part interactively in the development of knowledge.

The Internationalization of the XXI Century Universities: UNINETTUNO Model

Deborah Arnold et al.

A true revolution is in progress, based not just on the increase of knowledge and of its applications, but also on the evolution of the processes of knowledge codification, memorization and transfer.

The globalized and interconnected world is part of everyone's life and political, economic, social and cultural spheres.

For millennia, on Earth, people kept on building, destroying and rebuilding separated worlds, frontiers and borders aimed at protecting what they deemed as precious and incorruptible. The Web is the largest public place that humankind has ever had at its disposal; it is the new public arena of the global society.

The new communication technologies accelerated the processes of internationalization of our society and created a new interconnected world that lives locally and acts globally. Global and local are interconnected. The Internet, as a set of interconnections, is at the same time centralized and delocalized. All the institutions that make up society today are mustering the courage to reinvent themselves using the Internet, the most powerful platform in the world that allows accelerating the processes of innovation, distribution, creativity, bringing together people, knowledge and skills at a global level. A new era has truly arisen, slowly changing the hierarchies and powers of a new globalized and interconnected society, enabling the academic institutions to collaborate and together train the younger generations needing the tools to move in the globalized and interconnected world and to create together the future. The technological network is also enabling the creation of an international network of universities and people who transfer and share their knowledge. Technology has become an important connector that allows the realization of international partnerships of universities belonging to both developed and developing nations. The collaborative nature of this technology promotes mutual understanding between peoples, and the benefits for individuals go far beyond the accumulation of knowledge. By means of the new technologies, universities can arrive directly in the homes of students from different countries of the world. They can create competences for global labour markets at distance, can act locally, nationally and internationally, emerging at the same time as important actors facilitating the internationalization of both universities and companies. Globalization, interdependence and communication technologies are now going on together and can give universities the tools to develop new models of collaboration in teaching, in research, in common programs design, in teachers and students exchange also in a virtual way. The existence of the Internet network, external to man, built on memories connected to each other, profoundly changed processes and mechanisms of knowledge production and communication. It has changed the languages with which today we communicate knowledge, has allowed access to knowledge for all the citizens of the world, even outside the traditional educational or training structures; it has really democratized access to the various levels of education. The creation of higher education global network, in which professors from different countries of the world participate in the collaborative construction of knowledge, is no longer a utopia but a concrete reality. The evidence of the great changes brought about by the Internet is the basis for the construction of the teaching and learning model of the International Telematic University UNINETTUNO (Garito, 2016).

The experience of the International Telematic University UNINETTUNO testifies what has been stated. Moreover, if we analyse the results of the international collaborations carried out by UNINETTUNO with universities in different countries, we can see how these collaboration models have brought to the partner universities a new vitality making them become protagonists of the global reticular economy.

UNINETTUNO University's Internationalization Models

UNINETTUNO's psycho-pedagogic-didactic model developed and keeps on developing taking into account the results of several research programs related to the application of computer-based and satellite technologies, to cognitive processes, artificial intelligence linked to the neurosciences, to Big Data etc. Based on the results of these research activities, several Internet-based learning environments were realized. These learning environments, available in UNINETTUNO's didactic cyberspace, allow for directly transmitting, from the university to the student-user, lessons, multimedia products, databases, self-assessment systems, tutoring support, exercise and organizing exam sessions. UNINETTUNO's model has greatly expanded knowledge communication models, created extremely dynamic virtual environments triggering collaborative learning processes between professors and students of different countries of the world. This facilitated the establishment of international relationships and the creation of new real and virtual environments aimed at establishing shared networks of knowledge among the various universities of the world and at supporting institutions' convergence. UNINETTUNO, through its model of internationalization, established a global network of public and private universities sharing their knowledge, their resources and technologies, curricula, research laboratories; easily arranging mobility plans for professors and students, still maintaining the specificities of each institution as a value and enrichment for the network. It built, on the Internet, a network of universities including not just technologies, but also and above all people, intelligences that are able to connect together their knowledge while respecting cultural, political, religious and economic differences. The development of this pattern of international relationships contributes to the establishment of a common area for globalized and interconnected knowledge.

UNINETTUNO University has made of internationalization one of its most important strategic pillars. The internationalization process has been developed and continues to develop according to two profoundly different models.

The First Internationalization Model

The first of these models is characterized by a completely new phenomenon, both in terms of modality and rapidity of diffusion, and is directly related to the Internet. Through the Internet, the citizen of the information society can select the training path that best meets his/her needs. Anybody, without moving from home, can decide whether to follow a distance degree program or training course to acquire competences and professional skills; s/he can customize his/her own study paths in a flexible way for meeting his/her needs in terms of space and time, by adapting them to his/her own cognitive style. Everybody can easily access

to multimedia contents and interaction tools even using different mobile devices such as smartphones and tablets.

Web users explore and select information and services available in the Web, making choices that are no longer strictly related to their country of origin, but that are mainly functional to their own interests. The Internet, and social networks in particular, allows these users to play an active role in promoting, suggesting and valorising information, contents and services they directly use. Web users themselves give importance to the *Web nodes* they deem more interesting and worthwhile to be suggested and recommended to their social network. This new model of quality recommendation and promotion at a global scale is possible through social bookmarking, by sharing a link and *likes* on social networks such as Twitter, Facebook, LinkedIn or Google+, as well as through an active participation in discussion groups, thematic forums and social review services.

It is through this spontaneous, networked, global, not supervised word-of-mouth mechanism that, in a few years, the International Telematic University UNINETTUNO has succeeded in getting, among its enrolled students, people coming from 167 different countries of the world (the 167 countries of origin of UNINETTUNO' students: Albania, Algeria, Andorra, Angola, Antigua And Barbuda, Argentina, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bolivia, Bosnia And Herzegovina, Botswana, Brazil, British Overseas Territories, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroun, Canada, Cape Verde, Cayman Islands, Chile, Cyprus, Colombia, Costa Rica, Côte d'Ivoire, Croatia, Czech Republic, Denmark, Democratic Republic of the Congo, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, Fiji, Finland, France, Gambia, Georgia, Germany, Ghana, Great Britain And Northern Ireland, Greece, Grenada, Guatemala, Guyana, Haiti, Honduras, Hong-Kong, Hungary, India, Indonesia, Iran, Iraq, Ireland – Eire, Island, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Kosovo, Kuwait, Latvia, Lebanon, Liberia, Libya, Lithuania, Luxemburg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Martinique, Mauritius, Mexico, Moldova, Monaco, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, Netherlands Antilles, New Guinea, New Zealand, Nicaragua, Niger, Nigeria, Niue, Norway, Pakistan, Palestine, Panama, Papua New Guinea, People's Republic Of China, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Republic Of South Africa, Romania, Russia, Rwanda, Saint Lucia, Saint Vincent And The Grenadines, San Marino, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, Somalia, South Korea, Spain, Sri Lanka, Sudan, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Trinidad And Tobago, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, United States Of America, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zambia and Zimbabwe).

UNINETTUNO is actually an institution without boundaries, as data prove. The data related to internationalization show that, in the latest 5 years, the foreign nationality students increased by 40%. The faculty with the highest number of enrolled students is Engineering and it is followed by Psychology, Economics and Communication Sciences. 95% of the

students enrolled in the master's courses live abroad. In addition, the data about USA is very interesting. UNINETTUNO is the only Italian university counting 230 students residing in the United States among its enrolled students. UNINETTUNO fuelled this trend also by democratizing the access to knowledge and to its contents, freely available on manifold media:

- On the satellite television channel, UNINETTUNO University TV; free on air on the Hot-Bird satellite reaching the whole Europe, the Arab World, Asia and Sub-Saharan Africa, broadcasting 24 hours a day academic lectures in Italian, English, French, Arabic, Greek, Chinese and Russian language.
- On UNINETTUNO Web TV, providing on-demand free access to a selection of the best academic lectures and to collections of special lectures in which politicians, intellectuals, international artists, actors, directors, writers and poets address relevant and current topics.
- On UNINETTUNO YouTube Channel, where video-lessons posted autonomously by UNINETTUNO students reach millions of views.
- On OpenUpEd European portal, realized by the EADTU (European Association of Distance Teaching Universities) under the patronage of the European Commission, where UNINETTUNO published its MOOCs (Massive Open Online Courses).

UNINETTUNO's courses (realized in several languages), and specifically courses provided in English language, saw the enrolment of a greater number of foreign students compared to the Italian users enrolled: an unexpected and non-promoted phenomenon, that occurred spontaneously, mainly due to the driving power of the Web.

Of course, having realized an educational platform unique in the world, available in five languages (Italian, English, French, Arabic and Greek) and ready for delivering educational contents in further languages, made international relations much easier. Even the decision of not relying on the mere "translation" of contents produced by Italian Universities' professors, but, on the contrary, to involve the best lecturers coming from various universities of the world – giving them the opportunity of preparing contents of the various courses in their own language – greatly helped internationalization. Students and teachers come from several countries of the world, not just from European and U.S. universities, but also from the universities of the Arab World countries. Several university professors coming from these countries, selected by special scientific committees according to their publications' international relevance, provided and are still providing their courses on UNINETTUNO learning environment. The courses of some faculties, such as engineering, are delivered in Arabic, French, English and Italian; other faculties are developing their contents also in English while all master's courses are already available in English and some of them in Greek. This choice was made both to make linguistic diversity become an element of cultural strength and to respect the different cultures cooperating. Additionally, this linguistic variety allows accessing information and sharing it, building one's own knowledge no longer only according to a local dimension, but also in a global perspective, finding out that some problems can be better overcome by working jointly with people having different cultural backgrounds.

The Second Model of Internationalization

The second model of internationalization is based instead on international agreements with universities and ministries of various countries of the world, aimed at creating, harmonizing and sharing curricula allowing students to acquire a qualification acknowledged both in their country of origin, in Italy and therefore also in Europe.

In the curriculum design process, UNINETTUNO follows the guidelines ensuing from the Bologna and Sorbonne Process related to study levels organization, and the ECTS (European Credit Transfer System) for structuring its curricula.

More specifically, all degree courses are compliant to the European Qualification Standards. For instance, for the design of the Psychology Study Program we took into account the standards of the EuroPsy (European Qualification Standard for Psychologists), as it regards the scientific-disciplinary sectors and university credits to be assigned to each discipline. This process of curricula compliance to international standards enables study courses and study titles acknowledgement at European level. For cooperating with partner Universities based in a country that did not join the Sorbonne/Bologna process, UNINETTUNO developed a model for the design of common curricula already successfully tested. A practical example of application is the conclusion of an agreement aimed at a double title jointly with Helwan University, Cairo. A first phase of analysis and comparison of the structure and contents of the Computer Engineering Curricula provided by the two institutions, both at a general structuring level and at single course contents level, revealed that, in spite of the different timing structure, learning outcomes and contents in the 3 years of UNINETTUNO program were equivalent to the first four-year course delivered in Egypt. Consequently, a common study program was designed according to which the Egyptian students get an Italian (and therefore European) study title in the first three years, and then integrates in their study programs courses envisaged by their fifth year of study for completing the 5-years Egyptian program. This process of analysis, comparison and integration among curricula can be extended to any degree course of any country.

Today UNINETTUNO has more than 257 agreements with traditional universities in different countries of the world such as Argentina, Azerbaijan, China, Columbia, Ghana, Japan, Guatemala, Ethiopia, Mongolia, Mozambique, Nicaragua, Russia, Senegal, Somalia, Singapore, United States of America, Vietnam, in addition to the most important European and Arab world universities.

This model of internationalization based on agreements between UNINETTUNO University and traditional universities of the various countries, allows two University models, distance and on campus, live together. In a natural way, an *intra muros* and *extra muros* educational and training model is being developed globally. All this is made possible by the fact that UNINETTUNO has created, exploiting the results of many research activities, a very innovative psycho-pedagogical-didactic model based on cognitive and connectionist theories,

which allowed creating online learning environments characterized by the quality of contents and the constant interaction between students and teachers.

These models of collaboration between distance universities and traditional universities are reinforcing a new model of real and virtual academic community that is enormously expanding the field of educational solutions and is increasingly promoting collaborative learning among students and professors from different countries of the world. The network of traditional universities has offered UNINETTUNO an extremely rich reservoir of human resources and knowledge. In order to produce the digital learning contents for its Didactic Cyberspace, UNINETTUNO involves professors from the best universities in the world who are open to implementing a collegial educational project. This model also helped traditional universities to develop innovation, both in organizational models and in the teaching methods of their universities. The traditional partner universities operate in spaces of collaboration and virtual cooperation but, at the same time, they are able to enrich with new meanings the physical spaces of meeting between students and professors. Socratic interaction models are developed in the face-to-face interaction where the student becomes the protagonist of the whole learning process, replicating the interaction models always applied in UNINETTUNO Interactive Class system, where dialogue is always at the base of a conscious growth of knowledge. In many years of collaborative relationships with traditional universities, exchanges of formative models have taken place between the different institutions, automatically leading to the development of new learning methods and new languages of knowledge communication both in presence and at distance. The international alliances really allowed UNINETTUNO to establish a global network of public and private universities that bring together their knowledge, share resources and equipment, curricula, laboratories, internal mobility of professors and students. All these results are achieved protecting the specificities of the individual universities as a value and enrichment of the network. On the Internet a network of universities has been built, made up of people, of intelligences that know how to connect their knowledge in respect of cultural, political, religious and economic differences.

Using the UNINETTUNO Interactive Class system and UNINETTUNO's Island of Knowledge on Second Life, students have the opportunity to study and think critically with their professors and tutors. They become active builders of new knowledge; together they create a true network of shared knowledge and concretely demonstrate that it is possible and easy to make young people of different cultures coexist with success and dignity.

Dialogue among cultures is not a utopia, but it is really possible. It is through this method that the University engaged in establishing a Euro-Mediterranean Area for Education and Research. The establishment of Euro-Mediterranean Area for Higher Education, deriving from the cooperation among distance universities, traditional universities, vocational training institutions and companies of several European and Mediterranean countries, is essential from a strategic, cultural, political and economic viewpoint.

The Internationalization of the XXI Century Universities: UNINETTUNO Model

Deborah Arnold et al.

Establishing cooperation relations among the academic institutions of different countries, aiming at producing educational contents designed for Internet-based virtual spaces and at jointly creating new systems and structures for Distance University, allowed to:

- promote universities' internationalization processes;
- design and develop shared curricula, and create for the attending students the necessary competences needed to live in a globalized and interconnected world;
- realize on the Internet multimedia educational contents also in different languages.

UNINETTUNO's model created new alliances among universities and educational institutions, developed real and virtual spaces, aiming at the creation of shared knowledge networks and a common Euro-Mediterranean Area in order to launch a path of harmonization of educational and training systems and to make them cope with the changes that globalization brought about.

The experience made confirms that it is possible to share curricula and create, jointly with the universities belonging to different political and cultural backgrounds, common paths of reflection and thinking.

Together, the interconnected minds of professors and students from the North and South of the world develop a network of competences and knowledge, based not on imposing one cultural model upon the other, but on comparing cultures and educational models. Together, a true laboratory for intercultural and inter-linguistic cooperation was created, enabling the development of a new virtual space, where all actors produce the contents and new teaching and learning models to make younger generations capable of becoming change leaders (Garito, 2008).

UNINETTUNO's professors and students are well aware of the fact that this internationalization model allows to create new balances between unity and diversity: the unity of values and traditions that memory gives us, and the diversity of cultures and languages. Universities moving under open skies, with no boundaries, build competences for social development and lay the foundations to build the future together.

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