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A Map of E-Learning

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Abstract – *Goal of the paper is to provide a map of e-learning, in order to help understanding the great complexity of situations hidden under this new and trendy term. Education environments are analyzed according to four main directions: learning models, didactic relationships, activities and technology pervasiveness. The analysis reveals that many apparently new ideas do not depend strictly on new media: new technologies act as a catalyst for a critical re-thinking of teaching and learning.*

Keywords – *E-learning, education systems, teaching and learning models, didactic relationships.*

E-Learning and the E-Syndrome

You can find it anywhere, the new word-extension trend: a little "e-" is being attached in front of everything that can be done involving a computer. The effect is a semantic improvement: an *e*-something is always better than its old-fashioned *non-e* equivalent. *E-learning* is no exception, and it has become a hypo in many magazines and journals much time before anyone could give a more precise definition than "learning with computers". This word is actually a huge hat for a number of different situations, ideas and whishes.

Goal of this paper is to trace a map of the e-learning domain. A precise knowledge of the object is the first step for discovering and exploiting, beyond all e-trends, the potentialities of new media in education.

Drawing a map is the explorer's and the geographer's duty. They shape a tool that allows people to find their way in a new place by describing and classifying the objects around them. Objects in our domain are education systems, i.e. integrated organizations of people, activities, technologies and contents for teaching and learning. Introducing new media in education systems requires the whole to be re-thought – a new map of education to be drawn[1].

New and Traditional Media

In order to provide a shared ground for the further discussion, we could elicit the meaning of the small "e-" as "involving new electronic media". This is the most general definition, and its purpose is to give us a wide perspective, leaving all implicit meanings aside. E-learning is not always *distance learning*, does not involve always the Internet and do not exclude any traditional face-to-face educational activity.

Moreover, *new* media means that we have to consider *traditional* media as well: books, photocopies, the blackboard and more recently the telephone, audiocassettes and television [1][2]. Many important factors in education are culturally coded in the traditional media we use, and could be lost if these would be abruptly abandoned. A gradual integration and co-existence of traditional and new media is the most sensible way to enrich the education process without spoiling it from the gains achieved in our past history.

The Reference Grid

Four main axes form the grid of the map presented in this paper:

1. *Models*: the structure and dynamic of the whole education system considered.
2. *Relationships*: the kind of didactic relationships established among the actors of the learning environment (teachers, students, tutors, etc.)
3. *Activities*: the didactic activities supported by new media.
4. *Media Pervasiveness*: the importance of new media in the educational activities.

Two other minor aspects, namely context and business, give some hues of color to the final drawing.

The map proposed in this paper has no claim of completeness or of uniqueness; our goal is simply to show e-learning as a complex matter where many issues are simultaneously at stake.

Models

The overall shape of an education system, i.e. its structure and dynamic, can be modeled after several blueprints. In our map, they correspond to the overall shape of continents, islands and seas.

[1] A map like the one drawn in this paper could be useful e.g. for the quality assessment of online educational experiences.

[2] It is perhaps not so obvious to include among traditional media even all those media that are culturally integrated in our lives such as language and writing [2][3].

Distance learning

This model stresses the fact that teaching and learning can happen outside a physical class, outside a school, almost without any spatial constraint. It was developed during the '50 and '60 with the spread of analogical communication technologies such as telephone and radio, supported by mail. The new information and communication technologies (NICT) obviously gave this model a new rise, especially with email, chat-lines and videoconferences.

The idea of distance is not only bound to the *spatial* dimension – the *temporal* dimension plays its role too, as distance education happens mostly in an asynchronous way: the activity of the teacher/tutor and of the students do not happen at the same time (except for e.g. telephone calls or chat appointments). Consequently, the idea of distance is connected with that of self-pacing.

It is important to notice that temporal and spatial distances do not mean automatically loneliness: online classes and tutoring are techniques that can build a lively social environment for distance learning. An example can be found in [4].

Open learning

The open learning model came during the '70 to extend distance learning. *Open* should be understood in contrast with the predefined school system curriculum, and stresses the fact that everybody should be able to access the system without constraints of age, preparation, etc…. The programs offered by the Open University are perhaps the greatest example of this model [5][6].

Open learning also describes learning environments in which the student has the *control* over his/her own activity. The system is *open* as the student can choose what courses to take, and to negotiate a contract for his/her own education or training program with the institution or a single teacher.

Self-learning

The basic idea of this model, developed in the '80, is that learning is an activity, an *act of the self*: it is the student who must do something in order to learn. Nobody can learn for anyone else – knowledge is can only be acquired personally. Effective learning can happen only when the learner is committed - none can learn anything if his will, intelligence and emotions are not somehow involved in the process[3].

In order to make the student's commitment real, learners should be given the control over the learning process: they should be able to choose what courses to take, how to organize and rhythm their activity, and have all the information for the quality assessment of their own activity.

Lifelong learning

Developed in the last decade, this model is a candidate for being an overall framework of education systems. Learning is the most suitable source of adaptation to the environment – *learn to learn* [7] is the law of the knowledge society jungle: who knows survives [9].

If learning is an act of the self, motivation is the most important engine of good learning. Learning to learn is not just learning *how* to learn, but learning *why* to learn as well.

Just-in-time learning, training-on-the-job and learning-by-doing

Lifelong learning is the required framework for the extension of a model of production to learning: that of *just in time*. The main idea is that learning should happen when required: it is a pointless expense to train people in a wide area of subjects or activities – the real point is to provide them with the specific bit of knowledge they need at any given moment during the work process.

The advantage is that the job needs (it also called training-on-the-job) become the drive for the whole process, thus increasing motivation[4]. Moreover, this kind of learning happens in *doing something*, according to the active learning pedagogy.

Conclusion

These five models are the common general shapes we will recognize on our e-learning map. They surely have some overlaps and are not exclusive, but can be integrated in hybrid systems with conventional models as well [10].

Relationships

We now try and categorize the main elements of the map: mountains, rivers, towns, etc. The actors of any education systems are the people involved in it. Those can be defined according to the roles they acquire in the system, which in their turn depend on the relationships among the participants.

[3] While this is proven both from sciences - especially psychology [7] and cognitive sciences [8] - and from experience, it can easily be misunderstood: stressing the role of the learner in the learning process does not mean automatically that teachers have no place in it.

[4] Nevertheless, many companies seem to consider training and education just as a cost. The consequence is that many programs suffer of insufficient resources in term of time on the employees' side. But is that really right to consider education as an expense? Can training be considered a part of productive work? Can a broad education of people be considered as a long-term investment?

The current pedagogical re-thinking bound to technologies produced violent criticisms against the traditional ideas of *teacher*, i.e. the person who transmits children (or adults, in other contexts) the knowledge they need. This brought to the idea of active learning, and to the proposal of alternative models.

Tutorship, Mentorship and Coaching

If learners should find their way into the world and are to hold the control over their activities, the role of the teacher should become that of accompanying them and simply help them, without explicitly *teach* them any content.

The idea of *coach* is taken from the sports: his/her role is that of encouraging the crew and pushing them to give their best – the ability is already in the person, for whom the coach is simply a stimulus and a methodological help. Similarly, *tutor* and *mentor* are someone who personally gives advice on a specific subject, with the aim of making the learner finally able to manage him-/herself independently[5]. Once more, tutors and mentors do not "transfer knowledge" to pupils, but just act like the parent's hands to the child learning to walk.

[Facilitator and] Self-Learners

Tutoring evolves to its extreme when transplanted in the context of self-learning. When it is up to students to decide what to learn according to their needs, when knowledge and resources are somewhere on the Internet, when evaluation can be given automatically by the e-learning server – the teacher should become a facilitator, i.e. someone who is just there in order to make the whole situation more and more suitable to learning. He provides optimal resources, helps students keeping in touch among them and with experts, makes activities efficient and smooth, etc. One thing he does not: teaching – he just makes learning easy.

Novice to expert

Direct contact with a professional is a highly valuable experience as it brings students in touch with real-world experience. The contribution could be generally less didactically suitable to them, but presents the whole complexity of real life situations.

Moreover, the contact with an expert is highly motivating, as the dynamic of fascination and of the example is livingly activated.

Peer Interaction and Group Dynamics

Students have to do not only with their teachers/tutors/facilitators, but among themselves as well. Group dynamics enhance learning through communication: in order to discuss a topic with a companion, a student must revise the concepts he acquired and formalize them in a more or less technical language. Moreover, discussions and collaboration allows perspective sharing: students consider more views of the same object, and not just the teacher's [11][12].

The shift from information technologies to communication technologies gave a new impulse to these pedagogical considerations, enhancing peer communication and interaction through online discussions, chat-lines, videoconferences, etc.

Conclusion

The definitions we gave are of course generic. Any real teaching and learning relationship strictly depends on the partners: their character, history, attitude, etc. heavily influence the outcome and the whole teaching and learning process.

Activities

It is now worth to give a look to the different kinds of activities new technologies can support in learning. Almost any traditional activity can be done with NICT, which offer at the same time new possibilities and new limitations.

1. New technologies can be used as storage and access medium for *resources and information retrieval.*
2. *Personal study and self-assessment* can also happen with new media, with special programs that come from the CAI and CBT experiences.
3. *Interactions*: expert contact, team working, discussion, tutoring can as well happen online with any communication application, from common email to videoconference [13].
4. Finally, *documents production and distribution* can be efficiently supported by new technologies.

Technology Pervasiveness

The last axe of our map considers how new technologies are included in real education environments and the relationship between them and the other pedagogical elements [14]. In fact, only a small percentage of existent education systems are 100% e-learning; more often[6] hybrid systems are the best solution for many applications [15].

1. *Adjunct mode*: online resources and activities are optional and additional in respect to the course curriculum.

[5] The only difference is that the tutor has a more institutional charge, while a mentor is a more expert collegue or "big brother".

[6] Of course depending on the context, goals and constraints of the whole system.

2. *Integrated mode*: activities and resources are partly offline and partly online.
3. *Completely online mode:* activities and resources are completely online.

Other Hues

The forcedly brief presentation of the four main axes of our map provided us with a first glance of the complexity of the world hidden under the simple hype *e-learning*. This first picture can be more detailed if the discussion is extended to include some other perspectives.

1. *Context:* it is clearly different if we are talking of a school, a university, a corporate training center or the UNO training program. Without coming to great detail, the context could be modeled as *Goals*, *Target, Content* and *Resources.*
2. *Business*: any individual involved in an education system has a role bound to the business of his/her belonging organization. Some common business roles are the *technology provider,* the *content provider or content expert, e-learning portal* and *educational multimedia publisher,* the *education institution.* From the individual point of view, being a *tutor* is a new job, requiring both specialized communication skills and technological competences. Finally, some institutions are thinking about *completely online degrees*, thus posing new institutional issues.

The Importance of Being a Catalyst

After this forcedly brief sketch for such complex a domain, one big question is still unanswered: how necessary are technologies to the learning models, activities and relationships drawn on our map? In other words, how much of the e-learning revolution actually depends on NICT?

In fact, to a more accurate sight, none of the pedagogical elements presented in the previous paragraphs is strictly bound to technology - they rather depend on precise educational strategies and personal choices of the instructors. What is then the role of technologies?

New information and communication technologies have been the oxygen breath that has given new impulse to the lungs of a pedagogical rethinking that was already looming around. In fact, they act as a catalyst to the renewal of the teaching and learning experience.

A pen is a tool for writing – as a consequence, we would say to a child that writing is drawing some signs, which we call letters, with a pen or something similar, like a pencil. Our concept of writing has changed with the introduction of a tool – is that so strange that now we think of writing as something we perform thanks to a keyboard? Any human instrument or *tool* –such as NICT - influences backward the work praxis that brought to its creation.

Using computers and data networks means to adapt a whole set of traditions, methods, personal experiences, content and institutional languages to a new way of work, that at the same time offers new possibilities and imposes new constraints. Trough the perspective of technologies we have a great opportunity to critically re-think the way we teach and learn, and the meaning of words as *education, training*, *teacher* and *motivation*.

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