Tools and Methodologies applied to eLearning[1]

Antonio M. Seoane Pardo, Francisco J. García Peñalvo
University of Salamanca, GRIAL Group

Abstract

The aim of this paper is to show how eLearning technologies and methodologies should be useful for teaching and researching Logic. Firstly, a definition and explanation of eLearning and its main modalities will be given. Then, the most important elements and tools of eLearning activities will be shown. Finally, we will give three suggestions to improve learning experience with eLearning applied to Logic.

Part I: Defining eLearning and its main modalities

The development of Information and Communication Technologies (ICT), and particularly the spread of using computers, produced a global change (a revolution, in fact) in the way we understand teaching activities.

But the most important event with regard to this is the arising and diffusion of the Internet as a global way to communicate, to learn, to share and to create information, experiences and knowledge.

One of the most interesting applications of the Internet is its use as a powerful learning tool, as well as the constitution of any kind of communities (scientific, researching, learning...) permanently informed and updated each other.

The application of web-based tools for learning purposes could be shown as a simple definition of eLearning. But what we *exactly* mean when we refer to eLearning? Should we apply eLearning tools and methods only for distance learning contexts? How could eLearning be useful for teaching Logic in our different contexts? These are three important questions to be answered in the next few lines, beginning with a clear definition of eLearning and a conceptualization of its modalities or ways to develop eLearning activities in different contexts.

ELearning could be defined as a teaching-to-learning process aimed to obtain a set of skills and competences from students, trying to ensure the highest quality to the whole process, thanks to:
- *mainly the use of web-based technologies;*
- *sequenced and structured contents based upon pre-defined but flexible strategies;*

- *interaction with the group of students and tutors;*
- *appropriate evaluation procedures, both of learning results and the whole learning process;*
- *collaborative working environment with space-and-time deferred presence;*
- *a sum of value added technological services in order to achieve maximum interaction* [Gar06].

It is quite common to associate adjectives like "virtual" or "distance" to "learning", in order to build synonyms for "eLearning". But it is important to clarify that we are *not* thinking about virtual learning or distance learning when we refer to eLeaning, at least not necessary.

When we try to develop a quality eLearning initiative, the receiving skills and knowledge are easier to demonstrate than in a traditional or *presential* context. So if we consider "virtual" as the opposite term of "real", eLearning is just *real* and not *virtual* learning.

But, from a philosophical point of view, *virtual* is "all that can induce an effect". If we consider that eLearning is different from many other forms of "learning" because of its active approach, it is clearly "virtual"; that is to say, it has the virtuality to "create" and not only to "assume" knowledge and skills.

With regard to distance learning, it's a common mistake considering eLearning as a form of distance learning, and applying its methods and categories to eLearning the results will be really poor. This is because eLearning is not *non-presential* like distance learning is. The actors in this process are present, on a different time and a different place, but their presence is verifiable, and leaves certain tracks. So eLearning is more than distance learning, and this is because of the human presence behind the technology, the net and the computers.

In fact, there are three different eLearning modalities, corresponding to three different contexts where it should be applied:

a) *Online eLearning*: is the typical "distance learning" context, where Learning Systems and technological environments let students to keep in contact with the online campus and learning activities.

b) *Blended eLearning*: this modality combines online strategies and methods with conventional or in-person contexts.

c) *Direct eLearning*: consists on applying eLearning technologies, methods and strategies to in-classroom situations, in order to promote collaborative, active and social knowledge, maintaining the possibility to evaluate both the whole results obtained and every single contribution.

Once eLearning and its main modalities were defined and shortly explained, now we can show which are the main eLearning tools and methods, and finally the main question concerning how these tools should help us to teach (and research) Logic will be analyzed.

Part II: eLearning Tools and Methods

According to the definition given a few lines ago, we could graphically represent eLearning as a quadrangular-based pyramid whose bases are: *Technology*, *Learning contents*, *Tutoring* and *Evaluation/Accreditation;* the peak of this

pyramid corresponds to a suit of transversal *Services* whose purpose is to improve and to connect the four bases to each other and, consequently, to ensure the quality of the whole process [Gar06].

First of all, we will try to define these five elements involved in a quality eLearning process; then, it will be possible to show how these elements should be useful for teaching and researching Logic.

Technology: with regard to eLearning, technology is the sum of specific hardware, software and network environments interacting for a learning purpose. Obviously, hardware requirements and infrastructures (computers, servers, etc.) are supposed to be at our disposal and their technical specifications are not interesting for us in this moment. But there are certain software solutions for eLearning that we ought to know to enlarge our learning and/or teaching experience. Some of these solutions are Learning Management Systems (LMS) or Virtual Learning Environments; Content Management Systems (CMS); tools for collaborative learning/working like Blogs, Wikis, Podcasts, Forums, Chats, Webinars, RSS channels; tools to create and manage communities, frequently associated to a CMS or a LMS; software solutions to create and share contents. Finally, these computers and software tools are interacting thanks to a network, whose most common example is the Internet, but there are several ways to create networks for learning purposes by using satellite technology, mobile devices like a cellular phone or a PDA (in fact, there is the term "mLearning" to refer this modality, similar to eLearning and not necessary related to the Internet) and others.

Learning contents: commonly known as "Learning objects", could be defined as every single information unity for learning purposes (from a single image to a big multimedia and interactive content) created and distributed by electronic media. Nevertheless, there are several definitions than extend or restrict the conditions required for an "object" to be considered as a "Learning object" [Sic06].

Tutoring: even (or should we say *specially*?) in an electronic learning context, human presence is the most important factor to ensure academic success. The main teaching role in eLearning activities belongs to tutors; in fact, tutor is the real *teaching* staff. On its work and excellent training relays an important part of a course success. Tutor's presence is permanent in the whole process from course design to knowledge monitoring and the evaluation of obtained skills, as so as the evaluation of the whole learning activity. To define it in a few words:

Tutor on-line is the teaching staff that follows a group of students on a part of their learning path, ensures the efficiency of teaching-to-learning process, promotes the achievement of aims and skills predicted for the academic initiative that he leads, by creating a context of collaborative and active learning, and evaluates how pre-established aims were achieved for students and for the academic intervention (quality management) [Seo06].

Evaluation/Accreditation: according to the most commonly accepted didactical theories on the matter, evaluation process must not be restricted only to verify the achievement of contents by students. Evaluation and certification of eLearning activities should be understood as a *global* process, focused to measure the achievement of skills and competences expected, and to evaluate the whole academic intervention, from the quality of learning objects to the usability of learning environment and, of course, the evaluation of learning staff itself.

Services: the whole learning activity is improved by a suite of technical and human services in order to support the four bases of eLearning and strengthen the interaction between users, technology, contents, teaching staff and accreditation system.

Part III: Teaching and Researching Logic with eLearning

As for any formal science, the use of computers has improved the teaching and researching experience also for Logic. However, to take the most of computers in order to assist us as teachers and researchers nowadays, it is crucial to exploit the capabilities of the Internet by developing eLearning tools useful for researchers, teachers and students. To sum up, what shall we do to adapt our labour to this *new paradigm*? These are three suggestions to ensure an excellent eLearning or eResearching experience:

a) *Developing web-adapted tools and contents and, for the near future, tools and contents also adapted to standards for mobile devices.* It is not enough to create applications and share them on the Internet to have a really interactive eLearning experience with these programs. If the application must be downloaded to run, many of the capabilities of the net will be missed (simplicity to share results and comments, report errors, etc.). So using web languages (like html, php, xml or javascript, for example) and developing contents according to eLearning standards and specifications will guarantee full-shareable and interactive objects and tools to improve our experiences.

b) *Adapting didactical methodologies for using eLearning contents and tools in order to promote workgroup, collaborative work and social constructionism for learning and researching activities.* Technology is not enough to get quality eLearning activities. In fact, eLearning environments by themselves offer poor results combined with didactical methods from in-classroom contexts. Consequently, it is important to take advantage of eLearning systems and tools of so-called Internet 2.0 or Web 2.0 to develop methodologies based on the interaction and obtaining of skills and competences desired for the learning activity.

c) *The most important factor in eLearning is the human factor.* Every learning activity, particularly if held by means of eLearning, must guarantee the interaction between the participants and the presence of teaching staff whose mission is different from teachers in classroom. In fact, it is possible to develop adaptative systems capable to "learn" user's behaviours, and to "decide" which contents or activities are more urgent or important for a single student, given certain parameters. But an adaptative learning design, adjusted to specific users and, above all, an effective monitoring of the whole process (not only in order to evaluate quantitative criteria -percentage of contents "passed"-, but mainly for ensure that students achieve the skills and goals planned for the course) is only possible if held by specific learning roles.

In eLearning contexts, teacher's time and effort to transmit knowledge is commonly substituted by documents, learning objects or documentation where the whole information for the unit can be found. So teacher's presence in eLearning contexts is not ever necessary to guarantee that contents reach the students, and

there is no need to reserve a time for it, but students play an active role by processing information and contents available *a priori*. And this scenario gives rise to the wrong model of eLearning "based upon the student", according to which students work absolutely in an autonomous way and, most of the times, with an absolute feeling of loneliness.

The absence of teacher in eLearning contexts (or its secondary presence) does not mean that there is not teaching roles. In fact, and just because eLearning make students play an active role, it is very important the monitoring of their work, by proposing activities, helping to solve any doubt or difficulty, evaluating the progresses shown by students, promoting collaborative work and learning by doing, to ensure the achievement of the specific goals defined for the initiative and/or pursued by single students. This basic role on eLearning activities, the real teaching role, is that carried out by tutors.

In conclusion, the real paradox of eLearning is that, although we need to change our methodologies and to make an effective use of technology, technology and methodology are completely vain if we do not count on the human factor that is (and will be) ever present on every learning activity.

References

[Gar06]   García Peñalvo, F. J. Introducción al eLearning. In *Profesiones emergentes. Especialista en eLearning* (García Peñalvo, F. J. *et al.* (Ed.)). Clay Formación Internacional, Salamanca, 2006.

[Seo06]   Seoane Pardo, A. M. *et al.* Tutoring on-line as quality guarantee on elearning-based lifelong learning. Definition, modalities, methodology, competences and skills *Virtual Campus 2006 Post-proceedings. Selected and Extended Papers. CEUR Workshop Proceedings,* **186**, 41-55, 2006 (http://ceur-ws.org/Vol-186).

[Sic06]   Sicilia, M.-A. *et al.* On supporting the process of learning design through planners. *Virtual Campus 2006 Post-proceedings. Selected and Extended Papers. CEUR Workshop Proceedings,* **186**, 81-89, 2006 (http://ceur-ws.org/Vol-186).