



Using an online tool for distance tutorial sessions: a hands-on experience*



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Resumen

La plataforma Elluminate Live! es un producto comercial diseñado específicamente para la impartición de clases virtuales y la video conferencia entre múltiples usuarios. En este artículo, analizamos su uso en el contexto de la realización de tutorías remotas en la asignatura *Informática*, de primer curso de la titulación de Licenciatura en Matemáticas en la Universidad de Valencia. Además de constituir una alternativa viable como complemento a las tutorías presenciales, el uso de la herramienta proporciona una serie de ventajas con respecto a éstas. Entre ellas destaca la posibilidad de supervisar el trabajo de varios alumnos de forma simultánea, de realizar explicaciones a grupos y de facilitar el trabajo cooperativo.

Palabras clave: Elluminate, tutorías, enseñanza virtual, enseñanza a distancia

Resum

Elluminate Live! és un producte comercial dissenyat específicament per a la impartició de classes virtuals i la vídeo conferència entre múltiples usuaris. En aquest article, vam analitzar el seu ús en el context de la realització de tutories remotes en l'assignatura *Informàtica*, de primer curs de la titulació de Llicenciatura en Matemàtiques en la Universitat de València. A més de constituir una alternativa viable com complement a les tutories presencials, l'ús de l'eina proporciona una sèrie d'avantatges pel que fa a aquestes. Entre elles destaca la possibilitat de supervisar el treball de diversos alumnes de forma simultània, de realitzar explicacions a grups i de facilitar el treball cooperatiu.

Paraules clau: Elluminate, tutories, ensenyament virtual, ensenyament a distància

Abstract

Elluminate Live! is a commercial product specifically designed to teach virtual classes and for multipoint video conferencing. In this article, we analyze its usage to perform remote tutorial sessions in the module *Computer Science* taught in the first year of the Mathematics degree at the University of Valencia. This tool not only constitutes a feasible alternative as a complement to face-to-face sessions but also provides a series of advantages. In particular, it facilitates cooperative work and allows the lecturer to both supervise the work of several students simultaneously and to give explanations for the entire group.

Keywords: Elluminate, tutorials, virtual learning, distance learning

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1. Introduction

The establishment of the EHEA (European Higher Education Area) offers us an opportunity to improve the teaching/learning processes at university by adopting new teaching methods that are more focused on learning and skill development (Méndez Paz 2005). Furthermore, the fast development of the new technologies and of the internet provides a supporting medium which gives new possibilities concerning methods, coverage, flexibility, and effectiveness of teaching. In this regard, we find remarkable the development of numerous tools, especially designed for teaching, and usually combined with active-learning strategies (see Holbert and Karady 2009; Rodriguez and Santiago 2005; Caruso and Salaway 2008). In particular, and consistently with the results of research showing the benefits of cooperative learning on academic results and on the development of reasoning skills and critical thinking (Johnson and Johnson 1989; Slavin 1991), several CSCL (Computer-Supported Collaborative Learning) and CSCW (Computer Supported Collaborative Work) tools have been created (Stalh et al. 2006). Also, in this field, the use of Web 2.0 (Anderson 2007), as well as wikis (Cordoba et al. 2009; Fuchs-Kittowski et al. 2004; Arevalillo-Herráez et al. 2010) and weblogs (Ferriter 2009; Williams 2004) are particularly relevant.

In the context of the gradual introduction of new technologies in the classroom, in 2003 the Universitat de València joined the dotLearn project, and customized it to shape it to its own needs (Essa et al. 2005). The result was the deployment of the LMS (Learning Management System), which is currently in use, under the name of Aula Virtual. Moreover, in order to give the system more possibilities, and while keeping on introducing new technologies, the institution considered introducing the use of a synchronized communication platform which would be useful both as a distance learning tool and as a support to face-to-face instruction. Therefore, they started up a one-year lighthouse project which began in March 2007, in order to examine the platform Elluminate Live!¹ (Sancerni Beitia and Villar Hernández 2008). After the positive assessment of the platform, the university is currently providing the service to teachers on demand.

In our case, we used this tool to carry out virtual tutorial sessions of Information Technology (IT) in the first year of graduate studies in Mathematics, as a complement to usual tutorials and to other follow-up and monitoring strategies. This initiative is framed within the context of the educational innovation plan of the Faculty of Mathematics which promotes the gradual adaptation to the teaching models of the EHEA, and of an educational innovation plan by the Vicerrectorado de Convergencia Europea y Calidad (Vice-Dean of European Merging and Quality) called Aplicación de las TIC en docencia Universitaria (ICT Implementation in University Teaching).

The rest of the article is structured as follows. Section 2 is a description of the context in which the experience took place, briefly describing the features of the subject and the learning methodology used. Section 3 introduces the issue which brought about the use of this tool. Section 4 is the description of the main features of the platform Elluminate Live!, its utilities, and the integration within the context of the subject. Section 5 is a description of the experience of the use of this tool. Finally, section 6 shows the conclusions of the article.

2. The subject

Information Technology is a core annual subject, which is currently taught in the first year of graduate studies in Mathematics, and it consists of 10.5 credits, divided into theoretical (6 credits) and practical (4.5 credits) classes. The subject is part of the educational innovation plan which started in the academic year 2003/2004 and which affects the whole first year of graduate study. In this subject, one of the instructors' main concerns was to increase both monitoring and direct support of learners, and that required the development of new, student-focused teaching strategies.

As an example, an infrastructure of correcting peer-tutors was created to conduct supervised supporting activities. These are senior students of IT Engineering graduate studies, whom receive free elective credits as a compensation for their service.

Peer-tutors have two main tasks:

- They are in charge of the correction of the so called corrector-exercises, a series of assignments that don't only need the student to mechanically solve the task, but also require a deeper analysis of the problem before solving it. These assignments are set in class, the students solve them at home, and hand them in to have them corrected, thus receiving feedback on their learning process throughout the whole course.
- They supervise open labs. The assignments that students have to develop during practical sessions are conceived so that most of them can be done during lab hours, and a few can be completed by the students on their own. This is why, besides usual practical sessions, they are offered the chance to attend open labs at a time when they do not have other classes. These labs are supervised by peer-tutors, such supervision being important from two points of view. Firstly, they help students solve specific doubts, so that they can complete their assignments. Secondly, these students act as tutors to other students, not only by solving doubts concerning the subject, but also other aspects of university life.

With regard to the contents, the subject is focused on teaching programming using the language C/C++. The practical sessions are conceived as a revision of the knowledge taught during theoretical classes. The latter are on a weekly basis, of compulsory attendance, and last one hour and a half. There are rather small groups of students (approximately 30 per class), encouraging a closer relationship between instructors and students, and allowing a better progress monitoring. In order to promote team-work, collaboration and learning through observation, students work in pairs. Most of the activities consist of creating C/C++ programmes, using Dev-C++² development environment.

3. The problem

Despite the relatively small size of the groups in practical sessions, it is hard to be able to provide customized attention to all of them. At times, the questions they ask require long explanations. Other times, though, the doubts they have are due to compile-time errors or environment issues. These kinds of doubts, though usually easy to clear, are numerous and require the immediate intervention of the instructor, so that students

¹ <http://www.illuminate.com>

² <http://sourceforge.net/projects/dev-cpp/>

can keep working. In such cases, the time students have to wait corresponds to a waste of time, since they are not able to go on with the activity. This usually causes a sense of hopelessness and frustration, which negatively affects motivation.

The issue is even bigger when this kind of difficulty occurs out of the sessions supervised by the instructor or the peer-tutors, either during the resolution of corrector-exercises, or during practical activities they were not able to complete during the sessions. In such cases, it is customary for the student to use office hours in order to solve such incidents, which causes them to waste time in commuting and waiting for the teacher, who could be assisting another student. Moreover, due to the frequency of this kind of problems their solution is specific and similar incidents are likely to occur again throughout the exercise.

Because of this issue, the need was felt of open labs, which without doubt help weaken this effect. However, it is not usually possible to adequately incorporate them into the timetables of the four group simultaneously, which usually causes low attendance. Therefore, and in order to increase practical activities support, and to help solving the compelling problems that students could have making the assignments, a lighthouse project in the subject was started up: the use of the tool Elluminate Live! to offer distance tutoring sessions to two of the four groups attending the course.

4. The use of Elluminate

4.1. The tool

The tool Elluminate Live! is a virtual environment optimized for teaching, which provides, among others, the following utilities:

- Communication between users connected through instant messaging (IM) or VoIP, if loudspeakers and microphone are available (with optional video).
- Sharing and transferring files.
- Pen pad.
- Sharing applications/desktop.
- Conducting surveys and publishing results.
- Presentations.
- Recording sessions.

Additionally, the tool allows the instructor to monitor at any time whether each user is allowed on the platform, in cases such as access to shared apps or the use of the pen pad. Figure 1 shows a screenshot of the application environment.

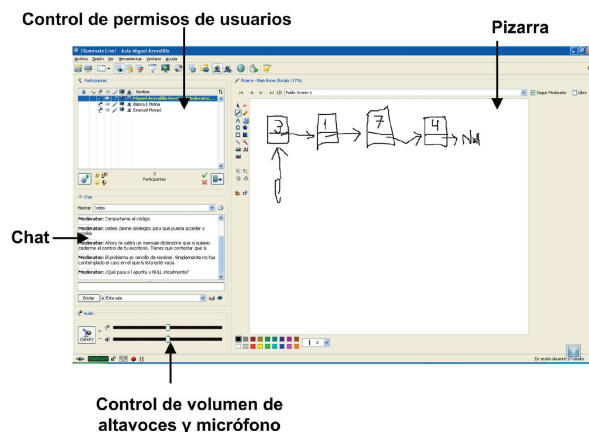


Figure 1. Screenshot of the tool Elluminate in use.

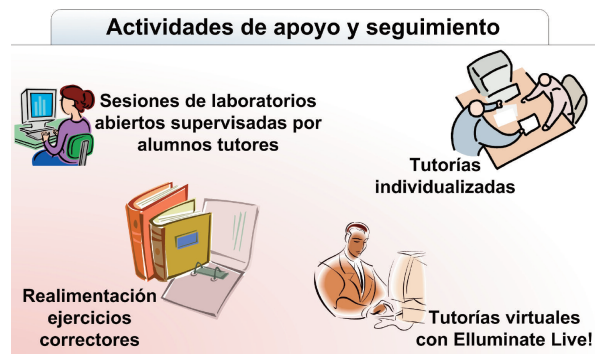


Figure 2. Means of support and monitoring of the assignment.

4.2. Integration in the context of the subject

With the introduction of the new form of tutorials, attention towards the students is increased, thereby granting them the chance to connect to this environment and use the advanced communication tools it provides. Among them, two tools particularly stand out. The first one is the pen pad, which the teacher can use to explain (together with a microphone and a graphics tablet), with which the students can interact once the teacher has given them the permission required. The second one, and perhaps more important, is sharing applications. This utility allows the students to share their development environment with the teacher, thus creating a real-time discussion about the deploy code. Besides facilitating compile-time errors solving, this utility is particularly useful to conduct interactive explanations. In this way, students can complete their assignments when they have not been able to finish all their exercises during the corresponding session, or even do it with a direct supervision when they have not been able to attend a practical session for a justified cause.

Virtual tutorials are complementary to other previously existing supporting methods, thus producing an integrated strategy combining the methods shown in Figure 2. Sessions supervised by peer-tutors and tutorial sessions (face-to-face and virtual ones) aim at supporting the students in carrying out the programming activities they have to hand in, which they are to begin in class during the practical sessions of the subject. The feedback they receive from peer-tutors is complementary to these sessions, since they provide the students with information concerning their progress, and help the teaching team detect any possible lacks of knowledge.

4.3. Start up

In order to motivate the use of this way of tutoring, a priority system was set, according to which, whenever tutoring sessions providing virtual tutoring service and any other face-to-face tutorials happen to overlap, one should prefer the former over the latter, which would therefore be cancelled until the query submitted through the tool is answered.

To prevent this priority system from making face-to-face tutorials impossible, it was decided that virtual tutoring would just take place on three out of the six weekly sessions dedicated to customized tutoring. The project began during the second term of the academic year 2008/2009, and to facilitate the use of the tool, one of the practical sessions was partly dedicated to showing how to use the system. This demonstration consisted of a brief presentation of the utilities it provides, and of a workshop-like completion of a series of simple tasks to show its functioning, such as sharing Dev-C++ development environment, using the pen pad, or IM.

5. Experience

Four weeks after the introduction of virtual tutorials, all of the students who regularly attended face-to-face tutorials had already used the tool, with a dramatic decrease of their face-to-face sessions attendance to 25% of what used to be. According to talks with these students, they found using the tool very convenient in order to solve specific problems or compile-time errors, but they preferred interacting with the teacher whenever they needed deeper explanations. For this reason, they kept going to customized tutorials to solve this kind of issues.

Additionally, another series of advantages stand out over face-to-face tutorials, which are detailed below.

Advantages over face-to-face tutorials

5.1. Avoids commuting

In order to join the platform, the only requirements are an internet connection and a web browser. In our case, the main ways to access the platform were:

- a) From the library on campus, using the IM utility.
- b) From home using Voice over IP.

Also, there were cases, though not many, of access from the IT room of the Faculty. Besides, as it is a distance tool, it allows students who cannot attend classes physically (due to illness or being abroad on an international exchange programme) to get the support they need to complete their assignments.

5.2. Assisting several students simultaneously

According to students, the main advantage was being able to complete their practical activities with direct assistance online. In general, while making the assignments they are not in need of constant assistance from the teacher, but rather a specific support to solve little doubts, so that they can proceed with the work. In this sense, the tool Elluminate Live! allows the teachers to fulfil the same function they have during face-to-face labs, moving across the room, solving doubts, or explaining. To do that, the most useful utility is sharing apps, which allows users to share their programming environment with other users (generally with the teacher). With this utility, the teacher can simultaneously supervise the work of several students logged at the same

time, and answer their questions, which seldom arise.

5.3. Fosters cooperation

Sometimes, and despite the fact that practice should be done in pairs, students surprisingly access the tool on their own. Although this could be regarded as a disadvantage in developing their team-work and interaction competence, it is generally compensated by the collaboration which takes place within the platform, when several students log in at the same time. During sessions with several logged students, it is not uncommon to see team resolution of problems, explanations about someone's code to correct errors, with the help of the tool provided by the application (see Figure 3). By promoting this kind of cooperation, it is possible to benefit from the positive effect that cross-age explanations have on learning (Plötzner et al. 1999).

5.4. Possibility to explain to groups of students

When common doubts exist, the platform also provides students with an adequate way to give explanations through the combined use of microphone and pen pad. Besides allowing to write and draw, emulating a traditional class, the board can be shared with the students, thus promoting their participation. The versatility of the tool makes them start discussions through combined media, enriching the teaching/learning process and promoting team problem solving.

5.5. Help monitoring the student

The prolonged use of the tool lets the teacher carry out a constant monitoring of the students, detecting possible lacks of concepts in their learning. Moreover, the way students use the platform becomes helpful for the teacher in order to detect and correct any potential interaction issues in the pairs of students. To this respect, it is worth mentioning various general cases which one could detect when a student logs on alone:

- Students who have to work with a more proficient colleague, and therefore do not have the chance to go deeper in concepts, preferring to make the assignments on their own in a more relaxed way, in order to understand the solving process better. There were cases of students who used virtual tutorials to do the exercises after having handed in the assignments.

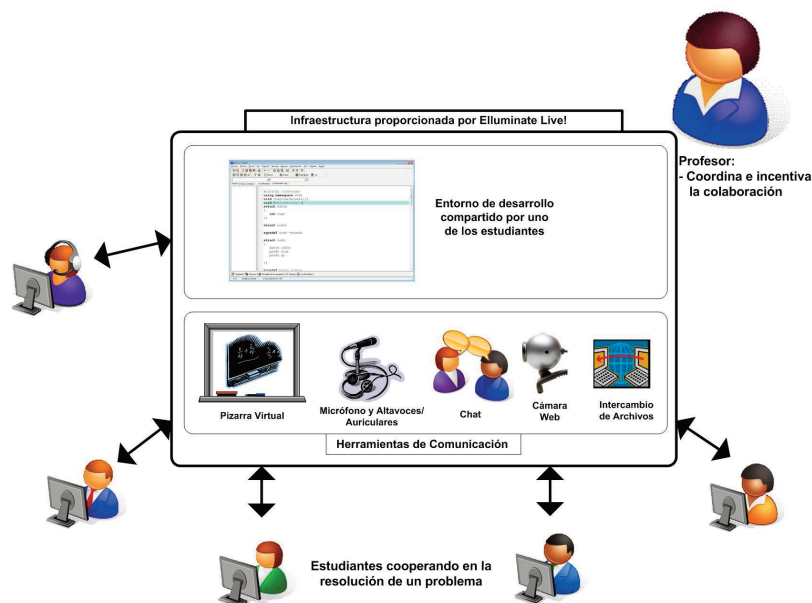


Figure 3- Elluminate Live! allows continuous team problem solving and lets the teacher create a collaborative working environment.

- Pairs who only worked as such during practical sessions (under the instructor's vigilance), but split the rest of the work after the session.
- Students who do nearly all the work, due to the other student's lack of interest.

5.6. Relaxed environment

Another aspect the students mentioned was the fact that the tool provides a more relaxed working environment than the classroom, since it lets them work at their own pace and it can be used in places they find more comfortable, such as their homes.

6. Conclusions

This article presented a practical experience in which we integrated a virtual tutoring system based on the tool Elluminate Live! as a support to students in making their assignments.

Within the context of the subject Information Technology in Mathematics graduate studies, virtual tutorials become a more important way of attendance than face-to-face sessions, due to the nature of the activities the student has to carry out. In this case, and thanks to the use of the communication and application sharing utilities, the tool provides benefits which are similar to those of face-to-face labs, but allowing simultaneous assistance to several students. Besides, it avoids commute, and promotes discussion and collaborative learning.

The use of the tool has prevented the common case of students attending tutorials with their laptop repeatedly on the same day, to solve little compile-time errors or development environment problems. Virtual tutorials through Elluminate Live! provide a more adequate way to solve such issues, allowing students to make their assignments with the direct assistance of the teacher and to ask questions online whenever they need help.

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