

A virtual campus for continuing education in health sciences

E. Rinaldi^{*1}, C. Dellacasa¹, S. Monducci², G. Ricci², G. Stabile¹, F. Rubbi²

¹ CINECA, via Magnanelli 6/3, 40033 Casalecchio di Reno (Bologna), Italy

² MED3, Via Massarenti 9, 40138 Bologna, Italy

The need for continuing education for healthcare professionals as well as the importance of constantly updated and available information are the pillars of the virtual campus "MED3". MED3 integrates educational issues and informative news on a web portal created to serve as a point of reference for the Italian healthcare professionals. MED3 has been accredited by the Italian Ministry of Education to provide courses within the Italian CME program. The use of technology allows users to access courses without leaving their homes and workplaces and without letting travel mobility be an obstacle to their professional development. They can adapt their learning process to their needs in terms of time, space and fields of interest. From any location, simply using an Internet connection, users can learn from texts, images, videos and animations provided with the online courses and check their educational path on their personal electronic portfolio. Online courses also include tests that, if successfully taken, yield credits certified by an electronic document that is automatically issued and sent to the user via e-mail. Besides being an e-learning centre, MED3 is also a communication environment where learners and experts can interact and benefit from collaborative learning. The access to a free exploration of a wide range of resources does not only help users reach their professional goals, but it also facilitates their individual growth.

Keywords: virtual campus; e-learning; portfolio; health; Continuing Medical Education; life long learning; continuing professional development

1. Introduction

The importance of Continuing Education for healthcare professionals is reinforced by the Italian Government Act that regulates the number of credits per year to be earned [1][2][3]. The consequent need to integrate the healthcare professionals world with educational issues has become a priority. The requirements of traditional face-to-face lectures do not facilitate the process of Continuing Education as they need to be fitted into professionals' busy schedules.

For this reason, the School of Medicine of the University of Bologna, National Healthcare System hospitals and clinics have joined together with CINECA, the most powerful supercomputing centre in Italy, to create MED3 a virtual campus that provides online opportunities for all professionals to learn, stay up to date and be informed at their very own pace and from any location.

2. MED3

Med3 is a virtual campus dedicated to research, development and production of learning content. The presence of the University is particularly relevant as it ensures a continuous improvement of lifelong learning methodological models. The National Healthcare System hospitals and clinics also bring in important educational and methodological issues, but they are also final recipients of the educational project.

CINECA is the technological partner that establishes the communication via the internet between content producers and course users.

The presence of both the University and National Healthcare System structures, allows to have an immediate feedback on efficacy and efficiency of the entire system that can evolve and improve accordingly.

* Corresponding author: e-mail: e.rinaldi@cineca.it, CINECA, via Magnanelli 6/3, 40033 Casalecchio di Reno (Bologna), Italy
Phone: +39 0516171666

By virtue of its constitutional members, MED3 is thus capable of providing high quality scientific content in an efficient and innovative way with respect of e-learning standards and control of possible conflicts of interest.

3. The virtual campus

3.1 Materials and methods

The advantage of a virtual campus is that learning content can be constantly updated and that users can freely decide when, where and what to learn without time and space constraints.

In 2004 the Italian Ministry of Education has started the experimental phase of CME accredited on-line courses. It did so by enabling 68 providers among Health agencies, universities, publishing houses etc... Med 3 was one of the selected providers and has carried out the experimentation throughout the year 2004. Since 2005 MED3 is one of the few e-learning CME providers that has been authorized to continue with the experimentation.

Starting from a commercial Learning Management System, Med 3 has moved on to an open source system, Moodle. The interface to access courses was customized to satisfy graphical needs and to be independent from the e-learning platform used.

The change to Moodle was motivated by the technological maturity of the open source platform which is in fact internationally known and widely used. The change was possible because both platforms are conformant to the SCORM content packaging.

All courses and activities are tracked to keep records of users progress. In particular the system stores the date and duration of users accesses and their test results. If the test is successful, a digital CME certificate is immediately issued and automatically sent to the user.

Personal data, together with the credits earned are stored in an ORACLE database and backed-up by redundant systems. Systems are monitored 24 hours a day.

Users also have access on the website to their personal e-portfolio area to check the courses they have attended and the credits earned.

In case of need, users can contact an online technical support or send emails to report their problems.

A scientific support team is also available for users who need content explanations by scientific experts.

3.2 Figures and tables

At the end of the experimentation registered users were more than 8000, 6716 of which actually accessed the courses and 5481 who actually obtained the digital CME certificate.

Tables below show for different healthcare professional categories the number of attempts to pass the CME test.

Table 1 Number of attempts before passing the test for nurses

First attempt	n. 3.424	65,51%
Second attempt	n. 580	11,10%
Third attempt	n. 311	5,95%
More than 3 attempts	n. 912	17,45%
TOTAL	n. 5.227	100%

Table 2 Number of attempts before passing the test for paramedical staff

First attempt	n. 168	66,14%
Second attempt	n. 26	10,24%
Third attempt	n. 15	5,91%
More than 3 attempts	n. 45	17,72%
TOTAL	n. 254	100%

Table 3 Results of 5841 feedback questionnaires on course relevance

Very relevant	2.721	49,64%
Relevant	1.956	35,69%
fairly relevant	760	13,87%
Little relevant	42	0,77%
Not relevant	2	0,04%
TOT	5.481	100% %

Table 4 Results of 5841 feedback questionnaires on educational quality

Excellent	2.823	51,51%
Good	2.186	39,88%
Fairly good	444	8,10%
Passing	26	0,47%
Not very good	2	0,04%
TOT	5.481	100% %

Table 5 Results of 5841 feedback questionnaires on educational efficacy

Very effective	2.622	47,84%			
Effective	1.947	35,52%			
Average effective	829	15,12%			
Not very effective	74	1,35%			
Not effective	9	0,16%			
TOT	5.481	100% %			

Table 6 Results of 5841 feedback questionnaires on required learning time over expected time

Much longer than expected	1.485	27,09%
Slightly longer than expected	734	13,39%
Same time as expected	1.925	35,12%
Slightly shorter than expected	1.069	19,50%
Much shorter than expected	268	4,89%
TOT	5.481	100%%

Users have accessed the course at all times of the day with a frequency peak between 6 and 7 p.m. Interestingly enough night hours accesses were not unusual.

4 Conclusions

This experience as well as the feedback received has been very useful for the evolution of the project.

In order to provide efficient educational e-learning units it is necessary to use friendly customizable and adaptable interfaces for different categories of users. The use of advanced technology is important to obtain quick operations and stability of systems.

The complexity of technology should not be perceived by the final user who should only benefit from it and not feel it as an obstacle. The surface of the infrastructure needs to remain very simple and easy, technical requirements should be low enough as to allow users to access courses from anywhere without technical obstacles. Technical support should however always be available.

All users seem to have taken the expected time to go through the course and pass the test. This means that for their first approach to e-learning, healthcare professionals appreciated the easy access interface and the concise format of courses. The answers received to feedback questionnaires confirmed that the most frequently reported qualities for courses were effectiveness and short duration.

From a technological point of view, this first experience has shown us how important it is to try to stick to standards. The content packaging standard in particular has enabled us to be platform independent, and continue to offer courses and provide credits exploiting the technological advancements.

References

- [1] Decreto legislativo 229/99 "Norme per la razionalizzazione del servizio sanitario nazionale"
- [2] Decreto n. 445 del Presidente della Repubblica 28 dicembre 2000,
- [3] Legge 23 dicembre 2000, n. 388