

# A Set of Rules and Strategies for UNSAM Virtual Campus

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**Abstract.** We present a first set of strategies for the establishment of a virtual campus. Additionally, a set of pedagogic and communicative rules is established with the purpose of achieving a better diffusion of the university contents among the students. These rules are constantly updated according to the teaching supply and demand, and the requirements of the teachers and the students. Additionally the different components of interactive education are present as well as their main functions in the virtual campus.

**Keywords:** E-learning, Campus Virtual, Pedagogy, Design, Hypermedia, Moodle, Software, Hardware.

## 1 Introduction

Today there are plenty of universities that have the new technologies available, or perhaps it is better to speak about the latest technologies, because of the continuous updating of software and hardware (in the current work both notions –or relation between signifier and signified [1]– will be used as synonymous), for instance. Some college teaching centers devote themselves exclusively to virtual teaching, such as in the case of the British Open University or Open University of Catalonia (UOC) [2]. Others, in contrast, have established virtual classrooms to boost the students' learning process outside college classrooms [3], [4], [5]. Now in both cases this entails that the students have at their disposal access to the Internet for these contents. Obviously, they can do it from their homes, from the cybercafe, the neighborhood library, etc. [6]. Here appears the first of the cost variables in this kind of teaching, ie the phone connection to the internet, and the computer in the case where the student owns it. Therefore, college centres should provide the necessary means so that these students can have free access to the exercises or practical works suggested by the teachers, for instance, in those virtual classrooms at those times when they are on the university

campus. Consequently, before setting in motion these projects it is necessary to analyze each one of the cost variables to avoid unforeseen circumstances in the future. Obviously, some of the main goals of distance teaching are: to increase the quality of education, to widen the teaching offered and to raise the social level of the community to which the university belongs, among others. In the current work a state of the art of the software and hardware within E-learning education and the first strategies and rules to foster the use of the virtual campus is presented. Simultaneously, the interface of the current system is made public as well as a series of attributes of quality to boost communicability.

## 2 Software and Hardware

The university costs in these projects entail the training of the teaching body in the use of these technologies, the promotion inside and outside the university through corporative publicity, to generate multimedia material, to dedicate space and personalized staff in the management and maintenance of the software-hardware, etc. With regard to the software the virtual campus manages, currently the costs are minimal as compared to the investments made by other American, Asian and European universities in the mid-nineties. The price reduction lies in what is known as open software [7], [8]. Thanks to this there are systems such as Moodle (Modular Object-Oriented Dynamic Learning Environment) aimed at E-learning. Concerning this there are colleges that have implemented this software with excellent results among students and teachers. This saving in the budget can be aimed at the realization of multimedia teaching materials of excellent quality and which guarantee the constant updating throughout time. When it comes to hardware, in our case, one might have two mirror servers. that is to say, that in the case that one fails, the second is automatically activated, using Linux as an operating system, thus avoiding additional costs through the yearly renewal of licenses in software material as it happens with other operative systems. Both servers should have firewalls available. Two PCs with the same configuration may be a transitory solution in the case that one of them breaks down. All these computer devices and network must have available a continuous energy supply in the face of potential electrical blackouts and in rooms that comply with the quality rules for the correct functioning of the computer system, that is to say, air conditioners. We see how the costs in computer material have also gone down as compared with the realities of the past decade. In spite of this, there are still European universities, for instance, that continue using servers for the internal management of the university with the campus or virtual classroom, with very high maintenance and great updating costs with regard to server hardware components [9]. In our case, we have available a magnificent system for SIU-Guaraní academic management, with the possibility of making excellent detailed statistic graphics in real time. However, no aspect related to classrooms or virtual campuses is developed yet. Consequently, we have started to project the main strategies to reach that target in a short term.

The SIU-Guaraní is a system of college information that administers academic management since the students enroll in college in a standardized way and profiting

**Fig. 1.** SIU-Guaraní system –database interface for academic gestion

data to the maximum. It has a single federal database, that is, it allows information to be added and for it to be reviewed in a decentralized way.

Some of its main functionalities are planning, fees management, classroom management, exam management, administration and expedition of certificates, management of pupils polls, diffusion of memos and communiqués through e-mails or SMS (students, teachers, and academic authorities), management of several interfaces: follow-up of the students who have finished their studies, accountancy management, etc. and even has an interface with Moodle, but which is in the development stage and will be aimed at E-learning. Access is through the university intranet and internet. It fosters cooperative and cooperation work, starting from the interaction among the different sectors and actors (authorities/student staff/teachers/students) [10].

Additionally, here also are to be found accessibility bases; since it is an on-line system it makes possible its availability around the clock, 365 days of the year. From the point of view of software engineering it has the main attributes of quality, that is to say, privacy of information, reliability, flexibility, adaptability, etc. [11], [12], [13], [14]. Some of the operations the students can do are: examinations inscription, reviewing the study plan and academic record, seeing the chronology of the partial assessments, class agenda, requesting certificates, updating of personal data, reception of files and messages, etc. On their side, professors can look up the students who have registered to their examinations, to register the exam grades in the records, to consult the schedule of the exams, etc.

In short, the SIU-Guaraní system is a very interesting tool of control over academic management and which makes easier to some extent some of the activities that the tutors/teachers have to carry out and the future students in the virtual classrooms.

### 3 Human Factors

In common with other public or private entities with a high number of people who interact among themselves, the human factor is essential to set in motion the projects, in order to avoid resistance to it. Within the context of the new or latest technologies in the education sector there are those whom Umberto Eco would call apocalyptic or integrated [15], that is to say, you are either in favour of or against their use. In the metropolis of the economically developed societies these problems virtually do not exist.

It is a population that constantly includes new technologies in their daily life activities [16], [17]. In other places it is necessary to boost the motivation among its participants, always trying to establish a horizontal communication, among peers, for which it is necessary to count on accurate rules to be followed by the virtual community that is generated with e-learning, and so that the democratization phenomena of distance teaching may reach each one of the most distant places in a national and international territory [17], [18] since we live in Mc Luhan's 'global village' [20]. It is necessary to remember that we have overcome the era of computer use and we are going through the quality era of communicability [21].

It is also necessary to remember that many students do not finish their mid-level studies, therefore, a campus or virtual classroom can motivate them for such a purpose, resorting to the public institutions. There are countries in Southern Europe where these studies can be finished in two years resulting in some cases even to obtaining a masters degree. Oddly enough, these private teaching centres guarantee the finalization of studies in a 100% of cases. Obviously, this is a reality that belongs more to the commercial sector than to education.

Now through social programs and having available sufficient economic and financial means, the causes of school-quitting might be traced, and thus put at the disposal of the potential students a whole range of pedagogical and technological resources to end the studies and later on, if they want to, they might follow their university studies.

The idea here is to introduce to the students a quick way to study and even if they are working, they have the alternative of finishing the studies for which they have registered. In other words, a well-structured and systematically functional virtual campus can speed up the timing in the process of teaching and learning. Simultaneously, a virtual classroom may overcome the problems originated by the workload complaints of the university teaching and non-teaching staff and which usually end up in some places in long strikes.

The students who have the virtual material can follow their exercises, see the exam schedule, see the grades, etc. It is a way of not damaging the students. A way to overcome the difficulties that the students usually have at the moment of having access for the first time to the virtual environments is through the implementation of a call center. The call center has to be active 24 hours per day, along all the weeks, including holidays. Perhaps a good strategy to overcome the human factors barriers in the first moments for the use of the instruments of the virtual classroom is to explain their main advantages, both for the teachers and the students, through a corporative or institutional information campaign, activation of an exclusive website with multimedial demos which explain the functioning of each one of the main

components of the virtual campus, training of tutoring students for the virtual community, etc. In the annex #1 a list with the main components.

All these lines of action have to be coordinated and follow the common goal of the democratization of the use of the virtual campus, inside and outside the college facilities [3], [22], [23], [24], [25].

### 4 Campus Virtual UNSAM: First Step

Next a series of active interfaces that have allowed navigation, and the first experiences with the main professors involved in the project:

One of the solutions to set in motion projects of this stature consists in external advice through other university realities (in this case, PUC of Valparaíso). However, we must remember that it is feasible for us to insert a foreign model 100% in the university context since the sociocultural variables such as the mentality of the peoples changes from one state to another.

However, the experiences of the bordering countries will always be more positive and adaptable to home reality than those coming from overseas. Without any doubt,

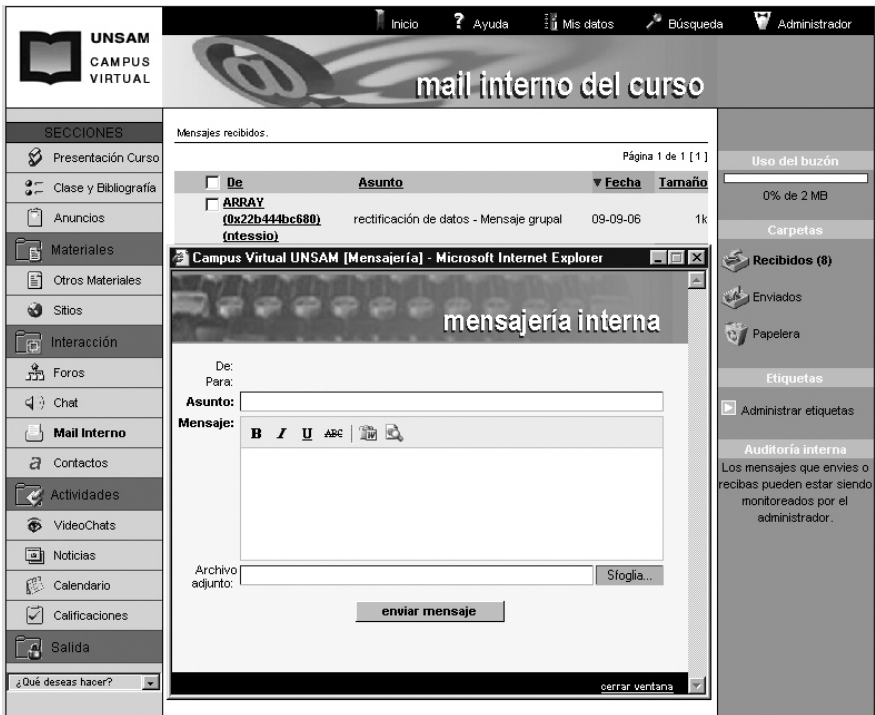


Fig. 2. UNSAM Virtual Campus: A simple iconography and minimal style desing of the interfaces. Two email options: intern. between students and professors/tutors (adove) and extern between the users and system administrator of virtual campus (down).

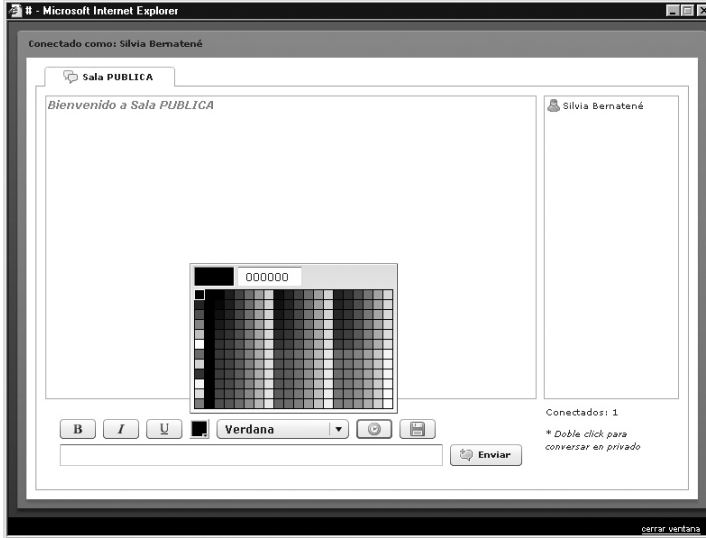


Fig. 3. A ‘classic’ chat system and menu of the colors for texts. It is a public area for all users with authorization –virtual campus system administrator.



Fig. 4. Marks and person responsible for evaluation, additional information, observations and details. In the right zone a list with all active virtual classrooms. Neat data and content disposition.

The screenshot displays the UNSAM Virtual Campus interface. At the top, there is a navigation bar with links for Inicio, Ayuda, Mis datos, Búsqueda, and Administrador. The main header reads "Apuntes, resúmenes, prácticos". Below this, a sidebar on the left lists various sections: SECCIONES, Presentación Curso, Clase y Bibliografía, Anuncios, Materiales, Otros Materiales, Sitios, Interacción, Foros, Chat, Mail Interno, Contactos, Actividades, Noticias, VideoChats, Calendario, Calificaciones, and Salida. The main content area shows a list of notes under the heading "1 archivo(s) / 4 categoría(s)". The notes listed are: "Clase 1 Melisa 4/10/07" (1 archivo), "Clase N° 3" (0 archivos), "Clase S Stella" (0 archivos), and "Sabato C1 11/10/07" (0 archivos). A modal window titled "AGREGAR UN ARCHIVO" is open, showing a form for adding a new file. The form includes fields for Usuario (Silvia Bernaténé), Tipo (Simple selected), Archivo (with a "Stogla..." button), Categoría (dropdown menu), and Descripción (with rich text formatting options). An "Agregar" button is at the bottom right of the form. At the bottom of the interface, it shows "Usuario actual: Silvia Bernaténé" and a link "Tu comentario o sugerencia nos interesa."

**Fig. 5.** Notes, summaries, practical homework, etc. option. Eassiness for attach files, add contents description and/or remarks, and selection of the categorie.

the current virtual campus contains activities that are currently carried out in the virtual environments aimed at E-learning. These are instruments which are not complicated to use, but which necessitate time for its learning by both tutors and students. The presented interfaces have made it clear that they have a very simple design, easy to use and not ambiguous [2], [26], [27]. The communicability for an expert user is optimal, however it is necessary to think of those users who have little experience in the use of computers. The activation and disactivation of the static and dynamic means, as well as their functioning, are similar to the main components of the Windows operating system [28].

## 5 Conclusions

Establishing a virtual campus entails following some general and secondary targets akin to the former, where achieving the common good prevails among each one of its

members whether it is as course organizers, multimedia content generators, E-learning tutors, active members of the virtual community, etc. The rules to be followed must be determined in a protocol of principles for the whole university community. These rules must respect usability and communicability of the interactive contents aimed at E-learning. A priori, the set of rules and strategies may seem to the final user of the system as a kind of normal pyramid, that is, at the top are the academic authorities, the professors, tutors, etc. However, it is not so, because it is precisely in the opposite sense. The switch of the pyramid is achieved thanks to the virtual community that is born from the E-learning process. That is to say, with the passing of time and through the use of the instruments provided by the new technologies of the virtual campus, we are in front of an inverted pyramid where we find the students at the summit. Besides, the use and circulation of free software make it possible to speed up this process. Axiomatically and undisputedly, it is necessary at the beginning to count with the greatest possible amount of available information, even from similar experiences in other universities and the cooperation of some outsourcing services. However, the final goal must be to transfer even these outer services inside the university context. In our case, we have available an efficient federal academic management system, but for the moment it lacks a virtual campus. Consequently, the set of rules and strategies presented are not static but rather dynamic, such as E-learning communication and education process. Finally, the costs concerning software and hardware have considerably lowered nowadays as compared to the past decade to set in motion a project of virtual campus.

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## Annex #1: First Set of the Components for a Virtual Campus

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### 1) Hypermedia On-line and Off-line –Design Categories

- Content
- Navigation
- Panchronism
- Presentation or layout;
- Structure

### 2) Quality Attributes

- *Acteme* is the study of communication as behavioural system.
- *Adaptability of the content*, that is, variety of styles of navigation, plenty of different media (text, graphics, maps, animations, videos, music and sounds), a wide control over active media.
- *Behaviour-animated help* analyses the attributes universality, simplicity, originality and humour in animated pedagogical agents.
- *Competence* considers how the systems adapts itself to skills of the main groups of users for navigation.
- *Isomorphism* sets down a range of constant formal features among the different components and design categories, i.e., content, layout, structure, navigation, etc., that is, it researches those components that remain equal in the different categories and especially the topology of the elements' distribution on the frame. Isomorphism seeks 'regularity in irregularity'.
- *Motivation* is the set of the dynamic means and structure resources that strengthen navigation in multimedia systems.
- *Semiosis for universal access* makes reference to the main components that converge in this attribute for systems multimedia: linguistic, iconic, attention, narration and education/formation.
- *The control of fruition* is the degree of autonomy in navigation that the structure of the multimedia system gives the user.
- *The naturalness of metaphor* assesses the user's ability to understand the set of images that make up the structure of the interface.
- *The phatic function* asserts the direct communication in the human-computer interaction process without generating mistakes.
- *The transparency of meaning* analyses the usage mainly of terms (also, images and sounds related to the words) of the interface that do not cause ambiguities between content and expression.
- *The triple dynamic coherence* analyses the relationship between text, image and audio in the dynamic media, nevertheless, this attribute does not consider the synchronization between audio and dynamic image (animation and video).
- *Unlimited iconic* consists of those icons and their components that, depending on the national and/or international cultural setting, have different meaning, for example, the gestures, the colours, the words, etc.
- *Acteme* is the study of communication as behavioural system.

### 3) Experts

- Communicability
- Human-Computer Interaction
- Human-Computer Interface
- Pedagogy
- Software (analysis and programming) and Hardware (systems)

### 4) On-line Learning –Main Elements

- Call center: info and problem resolution support
  - Interactive communication: Email, chat, netmeeting, etc.
  - Portals (website –Internet and intranet)
  - Teaching materials: book style and support (digital and/or analogic), production, publishing, etc.
  - Tutors: virtual or real
  - Virtual community : integrants and administrators
-