
THE PARADOXES OF THE DIGITAL DIVIDE: THE USE OF ICT AS AN INDICATOR OF CHANGE IN UNIVERSITIES

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Abstract: Here authors present an exploratory study, carried out in five universities (four of them in Latin America and one in a Spanish university): Universidad de Los Lagos (Chile); Universidad San Francisco Xavier de Chuquisaca de Sucre (Bolivia); Universidad Nacional de Córdoba (Argentina); Universidad Autónoma Juan Misael Saracho de Tarija (Bolivia). Universidad de Santiago de Compostela (Spain)

The AIM of the study is to analyse the possibilities, difficulties and limits facing the Institutions of Higher Education as they deal with the challenges of the knowledge society.

Our findings reveal numerous similarities among the universities analyzed in spite of their different contexts. The most relevant difference was found in the resources and equipment available as well as the organization and centralization of university information systems (via Web or portals).

The clearest conclusion to be drawn from the study is that far from strategically minimizing the transmissive approach to teaching and fostering the necessary changes, university policies for integrating ICT into education actually reinforce these practices.

Keywords: ICT in Universities, teaching in knowledge society

Challenges and demands of the knowledge society: the digital divide

What are we talking about, when we refer to the challenges facing universities? (in particular, in the current socio-economic context that some authors have called the *knowledge society*).

The underlying phenomena that we are currently experiencing in our space-time coordinates can be summarized as:

- Globalization,
- Universalization,
- Market economies and
- The expansion of the Information.

These phenomena require that university offers solutions that are also globalize. It also requires policies that help alleviated the so called *digital divide*.

In this context, universities face challenges such as:

- The elaboration of social projects that aim for socio-economic development in their own communities, taking into account the local culture;
- To become a flexible organization, that learns, and is ready to modify its structures, programs and working methods, as well as administrative and financial aspects;
- To become aware of its responsibility for training future professionals for the development of a society characterized by abounded information and advanced technology;
- To establish relations with other social organizations like companies, public institutions and non-governmental organizations, as a way for obtaining mutual benefits.
- To establish permanent links upon multiple social actors and with diverse fields of knowledge. This implies providing the necessary tools for receiving, and assimilating that come to us from the dominant geopolitical sectors: to filter and adapt that knowledge to the local context and its necessities; to rediscover the traditional wisdom of the native peoples which often have demonstrated greater depth than western science;

- Create, maintain and develop information and learning systems together with other national and international institutions.

Nevertheless, the diagnosis of the situation reveals to us that, in the majority of cases, universities are encountering serious difficulties to deal with these challenges, because they imply processes of change and transformation that are very costly.

The initial assumptions guiding our research regarding the elaboration of the tools and the data analysis include the following:

- Reductionist view of the concept of “digital inclusion”. Most of the earlier studies which we have reviewed only refer to the universities’ technical infrastructure resources, but they overlook such important aspects as training in their use, the content and its purposes;
- The need to re-think the teaching proposals in the direction of changing the way teaching and learning is done at the university. This is in line with the conclusions of a number of studies and theoretical analysis carried out on this subject matter;
- It is often forgotten that it is necessary to pay close attention to the adaptation and transformation of organizational aspects in order to deal with the challenges.

Aims of Research

In this context we propose the following research aims:

- To inquire into the possibilities, difficulties and limitations which institutions of higher education face when dealing with the challenges posed by the knowledge society;
- To elaborate action projects adapted to every context;
- To diagnose the current situation at each University;
- To create a network of universities.

Universities that are working on this project have put together a network that is still at the initial stages, because there is much to do in terms of content and ideas.

In any case, we have put together a collaborative environment which encourages interdisciplinary teamwork and a horizontal structure. We are betting on a project in which everybody wins.

The network has a visible part: the UNISIC portal.

Here we have a capture of the portal, a web site where we can share our conclusions, doubts, research conclusions, etc.



Diagnosis of the current situation at each University: empirical study

An electronic questionnaire was applied to a sample of professors from the participating universities. Questionnaires were sent to 4705 subjects, of which 462 responded. The data were analyzed with the SPSS 14.0 statistical software package.

We decided on an intentional sampling, and a sample was selected in which the six knowledge areas defined by UNESCO were represented. This is an appropriate procedure for a study of an exploratory nature. The response rate was less than expected, but sufficient for research in this context.

Although we realize that the response rate is low, our intention was not to make a likelihood sampling, but an exploratory one.

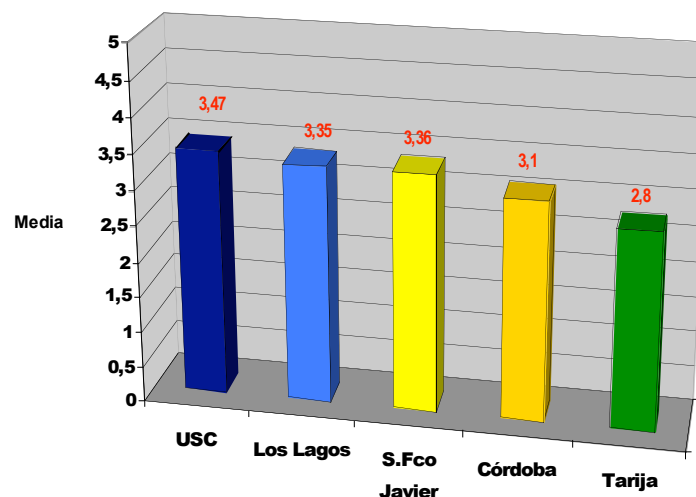
The questionnaire was structured in 6 blocks:

1. Identification Data;
2. Education modalities;
3. Decisions that professors takes when using ICTs for teaching;
4. Characteristics of interactions mediated by ICTs;
5. (Resources and materials that are used and produced);
6. Characteristics of the interactions (Ease and difficulties teaching staff encounter to integrate ICTs).

Some of the results of the empirical study are detailed below.

Use of ICT in university teaching

The first relevant aspect that appears is that most of the professors surveyed assume that they use ICT in their teaching. There are no significant differences among the different contexts.



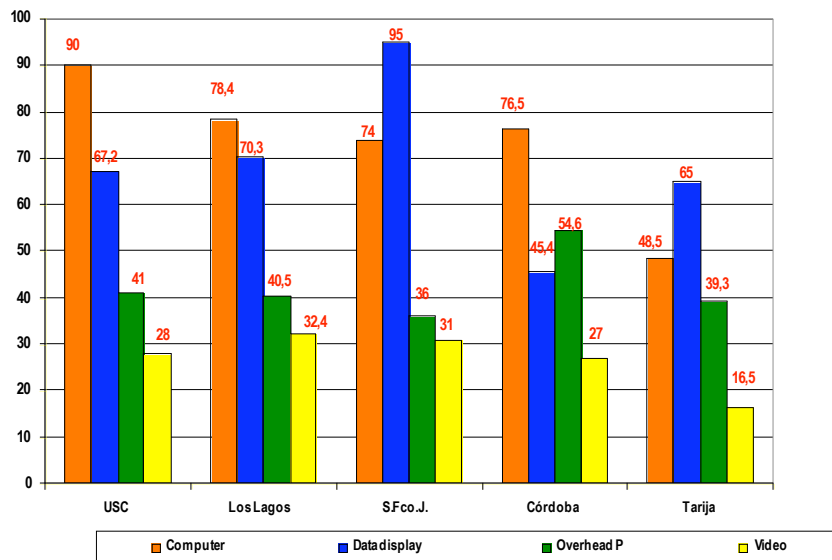
Most widely-used strategies in the practice of teaching

When asked which teaching strategies were most often employed, the lecture class predominates and the sequence is similar in all the universities. Based on these findings, we can infer that we are dealing with a **knowledge transmission model**, as the dominant education paradigm

So with respect to this Knowledge transmission model, which ICT are preferred?

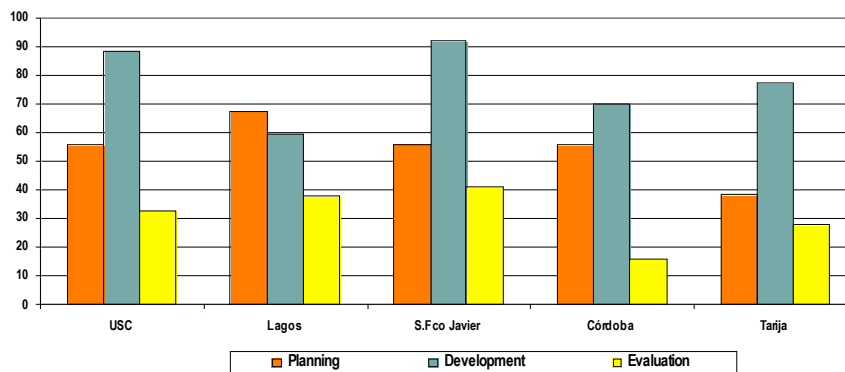
Most preferred ICT

Moreover, the preferred ICT are those that basically serve to support that model of transmissive education: computer, data display, projector and video player.



What ICT is used for

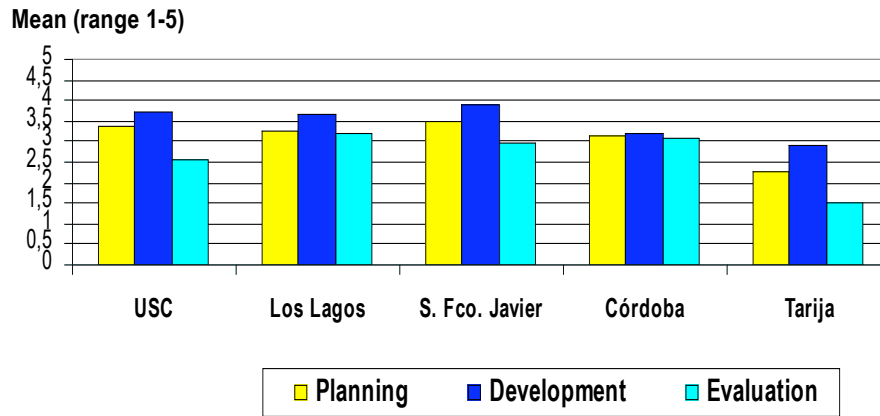
It isn't used much for planning and the lack of use in learning evaluation is especially significant. We don't observe a methodological shift. The question here is... Could it be that there is a distrust of ICT in learning evaluation? Our study can't answer this question, but perhaps it is a good topic for future research.



Changes produced by the use of ICT

For what we have seen up to now, the predominant model of teaching and learning has been maintained through time in spite of ICTs. Nevertheless, professors perceive that the use of presentations, instead of the traditional blackboards, for example, has produced changes in their teaching. This positive idea of ICTs as introducing improvements on their own, is present in the representations that the teaching staff has of ICT and their role in teaching.

The view that the teaching staff has, regarding ICT and their role in teaching, seems to reflect the idea that ICT can produce improvements on their own. This is important because it lead teachers to feel justified in maintaining the transmissive teaching model.

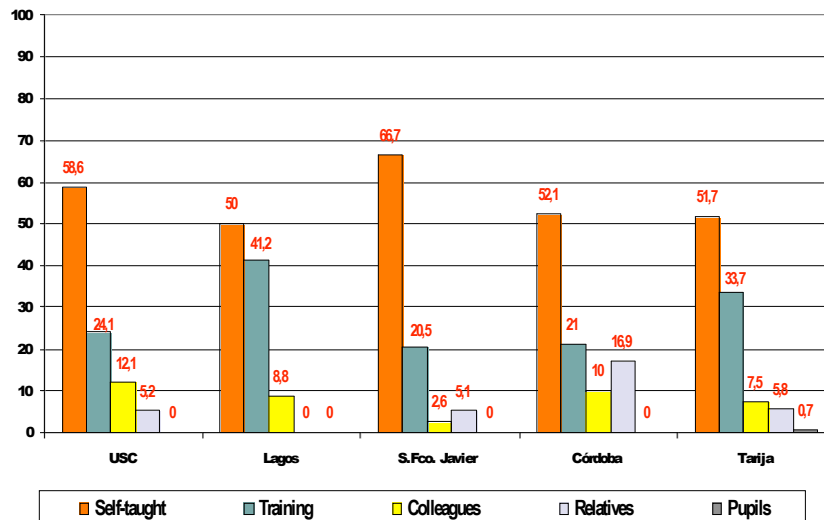


Ways of beginning ICT use

This question aimed to analyze if there has been some type of institutional recognition of the training that has been carried out in each context.

The majority perceive their training as self-taught, somehow there seems to be a negation of the impact of the training that has been carried out in the different universities, and fundamentally of its real impact on practices.

We also found teachers initiating alone, without the presence of colleagues collaborating or working together. Nor do we perceive in this process the presence of students, helping professors to begin incorporating ICT.



How is the university getting ready the knowledge society? Possibilities, limitations and difficulties.

Our research focussed on the possibilities, limitations and difficulties the university encounter as they get ready to face the challenges of the knowledge society. Our first conclusions are about these three aspects:

Possibilities:

- The universities are making an effort to incorporate ICTs into teaching;
- Most of the teaching staff recognizes that they use some type of technology in the different phases of teaching: planning, development and evaluation;
- This use has meant changes and improvement in significant aspects of teaching;

- Most of the professors surveyed report using pre-elaborated digital materials and a high percentage adapt or create materials themselves.

Limitations:

Little use is made of the specific spaces for the development of materials. In response to the question where and when they elaborate materials, the majority of professors indicate that it is outside of regular working hours and institutional space. Indeed, ICT imply intensified work for the professor.

Difficulties:

- Coherence between the type of methodology and the type of TIC used reinforces traditional methodologies. This transmissive methodology remains and there is no change in the deepest aspects from a didactic or organizational point of view;
- Resource policies have followed this process, classrooms and have been equipped with computers and projectors and professors use what there is;
- Professors work individually, to the detriment of teamwork, and this enters into a contradiction with the network society;
- The ICT training modalities that the different universities have pursued have had little impact on the way in which professors teach their classes;
- There is no official recognition of the efforts of professors to incorporate ICT in their teaching (ICT materials must often be elaborated outside the regular work hours);
- There was a question in the end of the survey, that professors how they see themselves. The majority see themselves as experts and transmitters of information and less as orientators, or tutors who respond to the new demands.

Conclusions

First of all, resources have been given priority: It is true that without equipment we cannot function, but that is not all there is to digital inclusion. It is necessary to advance towards the creative and critical suitability of technology. This priority of infrastructure does not take a strategic perspective into account. In many instances, purchases have been made before determining what use to give the equipment. This implies an economic and political weakening of the institution. In all the universities there is a period of non-use that is significant, especially considering useful life of this equipment nowadays. This has been a common occurrence in both Europe and Latin America.

We are aware that a device by itself cannot make changes. If it is introduced without any planning of its innovation impact, the teaching staff does what it can with the equipment.

Resources also have reinforced the role of traditional teaching, which suggests that little forethought has been given to the introduction of these elements into the institutions.

Thus, a need is inferred for making professors think about the new role, and the new social needs. It will be necessary to conceive of a systematic training proposal, maintained through time. Universities should reflect on their own approach to the knowledge society and propose lifelong learning also for university teaching staff.

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