Paper 100 – Full Paper

Could We Innovate In Curriculum Using Traditional Elements For Development? A Revision of Online Practices in The University Of Murcia

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Abstract

In this paper we describe an analysis of the curricular elements which organize the online courses in the University of Murcia during the period 2004-2005 and 2008-2009.

In addition, we also examine the analysis model we built. This model was the basis of the study and was the result of a far reaching review of the current literature and includes, in a single tool, every element included in the development of an e learning course.

The majority of teachers in traditional universities are not professional teachers. They are experts in their areas of knowledge. Because of this, their interest in the role of curriculum development is quite low. This study reveals that even when they are trying to innovate, they still continue to use only the elements they know; despite those elements not fulfilling the needs of their courses.

1. Introduction

Until now, research focused on e-learning and on curriculum, has been carried out separately. There are several classic studies which have explored the elements of curriculum in education (Bishop, 1985; Block, 1971; Bloom, Et Al. 1956; Gagne, 1965; Rowntree, 1974; Taylor, 1975; among others), and some of these studies have proposed various analytical models. Moreover, many recent studies have analysed different examples of the implementation of ICT in education, course design, and the development of Information and Communication Technologies (ICT) tools for e-learning, as in the work of Bates, Manuel & Oppenheim (2007), Collis and Van der Wende (2002), Kirkuk & Kirkwood (2005), among others. In addition, there are some specific studies about the impact of new technologies on academic models, as in the studies of Salinas (2004) and others.

Nevertheless, in the wide majority of these studies, the elements of curriculum are analysed within the context of traditional education (face to face). Only some of them use ICT as a resource for teaching. And only in a few more recent pieces of research do they analyse e-learning from the pedagogical point of view. Furthermore, in the reviewed literature, there are few studies focused on e-learning in the curriculum and which understand curriculum as a complex concept which includes not only design and planning, but development and relationships between participants. And there are even fewer studies based on practical experiences.

Additionally, is not clear that professionals who are working in e-learning at universities have the sufficient skills to effectively design and evaluate e-learning, even less use innovative approaches to develop courses (Condie & Livingston, 2007). They are specialists in their fields of knowledge (Escudero, 2008), but the majority of them are not educationalists. In fact, most of them don't have teaching qualifications.

To understand the connection between theory and practice would improve the planning and development of online courses (Yukselturk & Bulut, 2007; Clark-Ibañez & Scott, 2008).

Our proposal is to examine this issue in depth, beginning with an understanding of the evolution of curricular models used in online courses in our university (The University of Murcia, in Spain), and at the same time suggesting a model for the analysis of curriculum development in online courses.

The data we present here are part of more extensive research which was focused on two main areas:

- *Understanding and analysing the model of curriculum development which underlies the online courses offered by the University of Murcia* (UM) at two different times; the first version of any online course in our university (2004-2005), as well as the courses carried out 4 years later (2008-2009).

- *Building a model of curriculum analysis for Higher Education e learning courses*.

In this paper we focused on a specific part of the curriculum development of the online courses, the curriculum process. For those courses, we analyse every element which takes part in the process, trying to understand if the theory of curriculum development we can find in the literature is effectively reflected in practice.

2. The Study

The study we present took the form of a naturalistic study based in a qualitative paradigm of research; however, trying to aim for a greater manageability of data, we used a methodology of research from a mixed approach. In other words, we combined quantitative and qualitative data collect instruments, in order to achieve a greater complementarity of data and a wider perspective of the processes we study. This perspective could help us to understand more clearly the educational reality we operate in.

The research had two phases of data collection (coinciding with the two periods analysed), and each phase was divided into three stages:

1. *Initial*, when we collected data about the learning context and planning of each course using three sources of information: teachers (interview), students (questionnaires) and the institution (institutional documents, statistics and registration data).

2. *Continual,* collecting and analysing teacher and student portfolios and anecdotal evidence, SUMA (the LMS of the UM) statistics, and documentation and data about the assessment provided by teachers.

3. *Final,* when we collected new data from teachers and students, using the same kind of instruments as we did initially –interview and questionnaire- and collecting general statistics included in SUMA.

The kind of study we attempted to carry out and the wide variety of data collection instruments we designed made it extremely difficult to define the participant sample. At the end of the data collection period, we had data from every course of the period 2004-2005 and from 18 (from 21) of the courses of the period 2008-2009. The other three courses did not give us permission to even obtain automatic data provided by SUMA.

Consequently, the sample was defined by the number of online courses in the periods 2004-2005 (15 courses) and 2008-2009 (21 courses). Our participant sample was therefore from 33 online courses (naturalistic groups), from five of the eight disciplines in the UM (no courses from Legal sciences, Mathematics or any Technical courses participated in this study).

2.1. A model for analysing the curriculum development

In order to carry out the analysis, we had to develop a model of analysis, and then, using this model, analyse the courses at our University.

Based on the whole review and its conclusions, we proposed the following model of analysis to understand the curriculum development of the e learning courses at the University of Murcia:
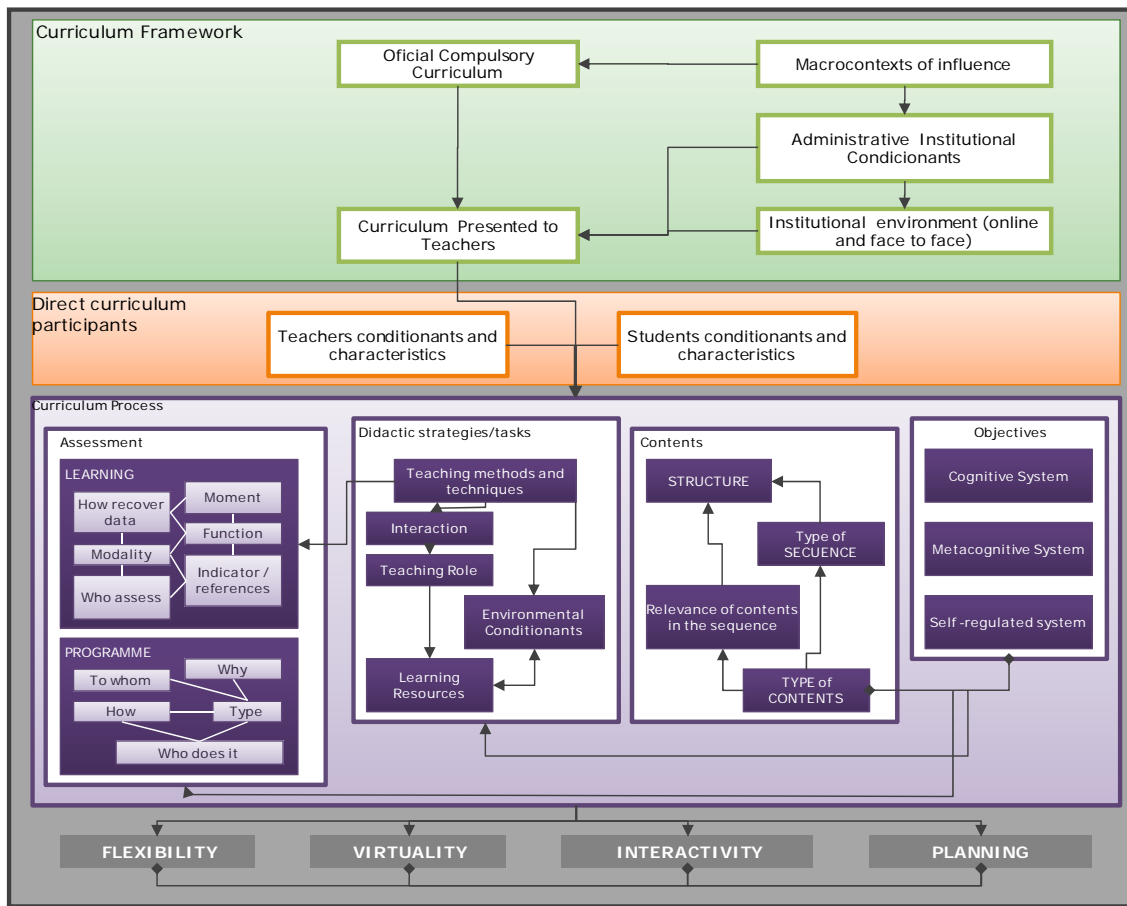
Fig.1. E learning Curriculum Development analysis model. Overview

As is evident in fig. 1, curriculum development has three principal focuses: curriculum framework, participants, and the curriculum process. Once the elements included in each part of the curriculum analysis has been defined, we can explore the four basic elements which define an e learning process and its relationships with those elements: Planning, Interactivity, Flexibility and Virtuality.

Based on this model, which is explored more thoroughly in another paper (Castañeda, 2011), we designed the research process.

We wanted to centre our attention on the analysis of the curriculum elements related to the curriculum process. Therefore, in the next section, we will briefly examine the structure we built as a basis of our analysis, and the sources which support this structure.

Next, we will explore the elements included in the Curriculum process (Fig 2). For this we separately explore objectives and contents (Zabalza, 1987; Anderson, 2005; Bloom et al, 1956; Krathwohl et al., 1964; Marzano, 1998 and 2001; Marzano & Kendall, 2007; Anderson & Krathwohl, 2001).
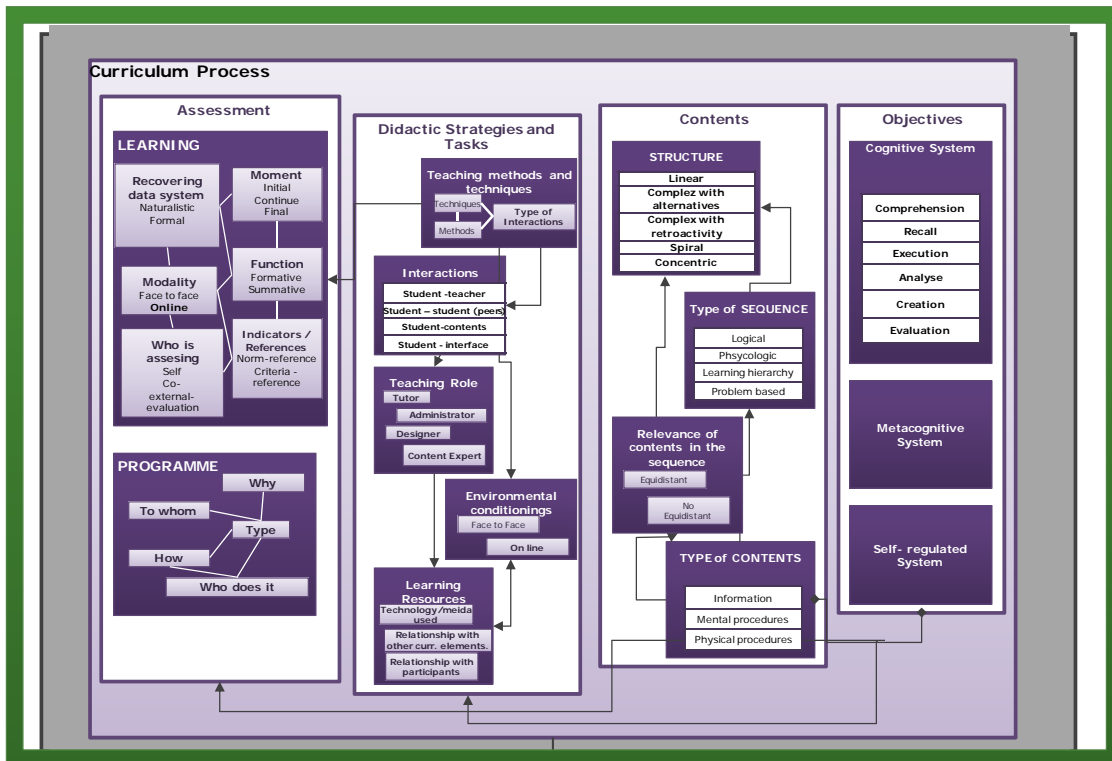
Fig 2. Elements of the Curriculum Process

We will also explore the organization and sequence of contents, based on the works of a variety of authors (Zabalza, 1987; Gagné, 1965; Rowntree, 1974; Toohey, 1999.

Teaching strategies/tasks, according to the proposals of Salinas (2004), Joyce & Well (2002),), Prendes (2003), Dillenbourg (1999), Berge (1995).

And finally, we will analyse the literature related to assessment, analysing literature from Salinas, García (2003), Airasian (1971), Rowntree (1974).

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2.2. Data collection difficulties

As we said previously, there were many difficulties in the development of this assessment. In spite of the original interest expressed by the university and the teachers of the courses to be part of the evaluation and to actively engage in it, day to day, it proved impossible to compile all the assessment processes, mainly because of the students or teachers.

At the end of the process we had the following sources of information from the 33 courses analysed:

Data Collection instrument / source	2004-2005	2007-2008	TOTAL
Initial Teacher interviews	15	15	30
Initial student questionnaires	40	120	160
Teacher Portfolio- diary	1	2	3
Student Portfolio- diary	13	51	64
Final student questionnaire	47	72	119
Final teacher interviews	3	6	9
SUMA Statistics	15	18	33

Fig. 3. Data collection instrument. Information Sources.

We received a great amount of data, from very different sources, and it was a challenge to amalgamate it into a readable format. However we can reach some interesting conclusions.

3. Results

Based on the individual analysis of each course, we can make a general observation about the curriculum elements. This analysis can show us how these elements manifest themselves in the UM online courses.

3.1. Objectives

Looking at the objectives of the online courses, we can see that they are diverse:

	OBJECTIVES							
	Cognitive System						Metacognitive System	Self-regulated System
	Recall	Comprehensi	Execution	Analysis	Evaluation	Creation		
Total Percentage	40	85	65	80	70	15	5	15
Total Frequency	8	17	13	16	14	3	1	3
Economics	0	2	2	**3**	**3**	0	0	0
Experimental Sciences	**3**	**3**	**3**	**3**	**3**	1	0	0
Humanities	0	**5**	3	**6**	4	0	0	1
Health Sciences	1	**2**	1	1	1	1	0	0
Social Sciences	**4**	**5**	**4**	3	3	1	1	2

Fig. 4. Characterization of the objectives of the online course

It is interesting that in virtually none of the online courses do curriculum development objectives appear which are related to self-regulation. The vast majority of the objectives are concentrated around the cognitive system, around comprehension, analysis and evaluation.

As we can see in the same table, this general perception doesn't change very much if we analyse the data in different areas of knowledge.

In the case of humanities online courses, the emphasis is on comprehension and analysis, but in Social Sciences s the great majority of online courses are centred on recall, comprehension and execution. In these two areas of knowledge this is where we have found the only cases of online course with objectives related to self-regulation. It is on a Social science course where the only objective appears which is related to the meta-cognitive system.

Frequently, the definition of objectives is unclear. Some of the teachers declare the intention to use meta-cognition and self-regulation. However, they cannot utilize them, even in the planning stage.

3.2. Contents:

In respect of contents, we have analysed four basic aspects: Type, Sequence, Sequence structure and Relevance of contents.

	Contents													
	Type			Sequence				Sequence structure					contents in the sequence	
	Informatio	Mental Procedure	Physical Procedure	Logic	Psychologi	Learning Hierarchy	Problem based	Linear	Complex with	Complex with	Spiral	Concentric	Equidistant	Non Equidistant
Total Percentage	55	**100**	0	**85**	0	5	25	**90**	10	0	0	0	**95**	5
Total Frequency	11	20	0	17	0	1	5	18	2	0	0	0	19	1
Economics	0	3	0	3	0	0	0	3	0	0	0	0	3	0
Experimental Sciences	3	3	0	3	0	0	2	3	0	0	0	0	2	1
Humanities	2	6	0	5	0	0	1	6	0	0	0	0	6	0
Health Sciences	2	2	0	1	0	1	0	2	0	0	0	0	2	0
Social Sciences	4	6	0	5	0	0	2	4	2	0	0	0	3	0

Fig. 5. Characterization of contents of online courses

As we can see in the previous table, the vast majority of online courses share common features. They have contents related to mental procedures, in logical sequences with linear structures where those contents are relative to each other.

On this point, it is quite interesting that the organization is the same as in traditional teaching models. There are no complex sequences, nor procedures related to physical contents.

3.3. Didactic Strategy:

In regard to the didactic strategies used on the courses, we have analysed their teaching methods, techniques, and interactions.

As is evident in the Fig. 6, individual learning is used in every online course. This is combined with other techniques, such as search information, participation, lectures and group learning.

If we look at these results in terms of areas of knowledge, we can see that in the health sciences online courses only Individual learning is used. In comparison, social science courses used a combination of techniques. Experimental Sciences, Humanities and Social Sciences are the only areas of knowledge that used group learning techniques.

	Search information	Individual Learning	Exposition methods / lectures	Participative	Group learning
Economics	2	3	0	1	0
Experimental Sciences	0	3	2	0	2
Humanities	0	6	0	3	1
Health Sciences	**0**	**2**	**0**	**0**	**0**
Social Sciences	**4**	**6**	**2**	**2**	**1**

Fig. 6. Teaching techniques used in the online courses.

Consequently, interaction between students and contents is mandatory in every course and interaction between students is only mandatory in 8 of the cases. Twice the number of courses used group learning techniques.

3.4. Learning Resources

In the section about learning resources we have included an analysis of three basic elements: function, code and structure. We also include it here in a more general format.

Regarding structure, as we can appreciate in the following table, the huge majority of learning resources used had the function of defining the course contents. Only 30% of online courses have used complementary learning resources.

	Guide	Content	Complementary Resource
TOTAL	16	17	6
Percentage	80%	85%	**30%**
Economics	1	3	2
Experimental Sciences	3	3	0
Humanities	6	5	1
Health Sciences	1	1	1
Social Sciences	5	5	2

Fig. 7. Learning Resources. Function.

Regarding the codes used in the learning resources, we can see the trends, as shown in the following table:

	Scheme	Linear	Linear Text with	Graphics	Audio	Multimedia	Hypertext	Interactive graphics	Interactive audio	Hypertext +	Hypermedia	Other
TOTAL	0	9	2	0	0	1	2	0	0	1	5	3
Percentage	0	45	10	0	0	5	10	0	0	5	25	15

Fig. 8. Learning Resources Types

If we examine the analysis of areas of knowledge, we can reach two conclusions. Firstly, that every online humanities course used only linear text based learning resources; and secondly, that some kinds of codes are only used in specific areas of knowledge, i.e. multimedia in Health sciences, hypertext in Social sciences, and Hypertext with pictures or audio only, in Experimental Sciences.

Thus, if we look at the analysis of structure:

	Linear	Branches	Parallel branched	Concentric branched	Hierarchy branched	Hypertextual	Mixed
TOTAL	10	2	0	0	4	1	5
Percentage	50	10	0	0	20	5	25
Economics	3	0	0	0	0	0	0
Experimental Sciences	0	0	0	0	1	2	0
Humanities	6	0	0	0	0	0	0
Health Sciences	0	0	0	0	2	0	0
Social Sciences	1	2	0	0	2	2	1

Fig. 9. Learning Resources Structure

It is important to remark that half of the online courses used learning resources with linear structures. This also coincides with the fact that 45% of online courses used only linear texts. In addition, we want to remark that learning resources with a branched structure were used only in social sciences. This is the same with the mixed structure.

3.5. Assessment

We have included an extra element in order to analyse what is interesting when we look at assessment. We have explored how many tools for learning assessment have been used in online courses.

We can see that 6 online courses (30% of the total) used only 1 tool, 7 (35%) 2, 5(25%) used up to 3, and only 2 (10%) used up to 4 methods.

In those courses which used one tool for online learning assessment it is interesting to see it is habitually an evaluation from an expert (normally the teacher), formally collected, online, criteria referenced and summative.

In the case of online courses which used two tools of evaluation, these formal mechanisms are criteria referenced, and the individual assessing is always an expert (the teacher). In all cases, at least one of the tools used is online, and in slightly more than half the cases, a face to face tool is also included.

The summative function is common to the majority of cases. Assessment includes two procedures; one which continues over the whole course, and another used only at the end of the course.

The majority of online courses which used three assessment tools preferred the formal collection of information and based their evaluation on criteria (criteria referenced). Surprisingly, the teacher is used only as an evaluator. It is very interesting to note that in these cases the vast majority of the mechanisms used had a formative function.

Lastly, we analysed online courses which used four assessment mechanisms.

In spite of being the courses with the most opportunities to include a diversity of assessment tools, the data we have is very homogeneous. Nevertheless, there are both common and distinct trends.

As with the general trend in the online courses, every tool employed the teacher as evaluator. The expert is the basis of the evaluation. In the same way, every tool is criteria referenced.

The majority of mechanisms were summative, but there are a great number (almost half) which had a formative function.

Unlike the cases which used between one and three assessment mechanisms, the majority of procedures used to assess with four tools are continual. Moreover, at least one of the four tools used naturalistically collected assessment. Naturalistic collection of information only appeared in these cases.

4. Conclusions and reflections

Traditional approaches to curriculum elements

In general, on the online courses studied, there are no objectives, contents, tasks or assessments different from those already seen in traditional (face to face) models. As previous studies have remarked (Conole et al. 2004; Condie & Livingstone, 2007), new working procedures do not appear in the huge majority of the online courses analysed or in the development of these courses. The only area where some changes are made is assessment, where some mechanisms of formative assessment appear.

All the teachers included in this study are highly motivated to "innovate" in their courses, but in the end have only slightly altered their current teaching practices, mostly in relation to technology. In spite of a desire to innovate, innovation is not reflected in changes in the curriculum (Heinrich et al, 2009; Condie & Livingstone, 2007).

It is crucial to emphasize the importance of teachers' awareness of the innovative power of the curriculum. Teachers should understand that each curriculum element determines innovation, and that as long as we continue to use these elements in the same traditional way, even when using ICT, there is no substantive innovation. As research has shown, different ways of organizing learning are crucial in order to improve the quality of higher education. (Yukselturk & Bulut, 2007).

Improvisation and lack of reflection

After the analysis of teacher interviews and student portfolios, we have the impression that approaches to online courses are not the result of deliberate curriculum design. The majority of what is included in online courses is improvised, in an ad hoc teaching process. There is no formal approach and no detailed evaluation. Therefore, considered curriculum design is not evident.

Improvisation is evident from analysis of the data, and in many cases occurs because the teachers are not aware of the full implications of neither curriculum, nor variations which could be introduced into it. It seems that teachers, understanding the course contents (all university teachers are specialists in their field), base their teaching on this and then improvise the rest of the curriculum elements as the course proceeds.

The paperwork included in the planning processes at our university includes an "instructional design" form, which is a document where teachers outline the objectives, methodology, resources and evaluation of the course. This document specifies the design of each course

and, at the same time, tries to help teachers reflect on their design process. As in the case of other "instructional design models" (Wang & Woo, 2008), it helps teachers to fulfil official requirements, but does not explicitly encourage them to justify why these resources are used in the way they are.

Consequently, the use of ICT as a tool is not based on profound reflection on the curriculum. ICT is used only because it is available. There is no conscious search for ICT tools for a specific educational approach.

It is critical to raise awareness among the entire educational community, of the importance of *planning* in the learning process. It is crucial to understand how different curriculum elements are closely related to each other and are at the same time conditionants in the process of curriculum development, particularly in distance learning and online learning (Godschalk & Lacey, 2001).

Online learning is a unique process and, as such, must be thoroughly designed and planned. In accordance with Clark-Ibañez & Scott "good online classes cannot be built by simply converting existing face-to-face courses" (2008: 36).

Emphasis on Contents

Every online course we have analysed was planned according to its contents. If there is any innovation, it is related to the way in which contents are presented, the media used, or formats of presentation. The majority of content is presented to students as linear texts of pre-organized diagrams with links to other diagrams in the same style. There is no innovation in methodology, teaching strategy or resources. Only technological.

The vast majority of university teachers are experts in their areas of knowledge, and this expertise has to be valued. However, their work as professional teachers is given very little importance by institutions (Escudero, 2008). Consequently, it is not strange than teachers plan their course curriculum around their expertise, rather than conscious design.

Online learning = learning alone

Despite interaction between students emerging as one of the most important dynamics in the learning process (Reed et al, 2010); especially when online (Muirhead, 2007), in almost every online course we have studied, teachers understand that students also have to work alone.

In the design of online courses, no peer feedback is included from students. In some cases, students have to participate in forums but in isolation, without positive interdependence. In the best cases, they have the support of the teacher in tutorials, but have no group work dynamic. This perception of the "student alone" is especially strong in Health sciences and Economics.

In cases where there is some group work, it is always face to face, but here the dynamic is also completely lost. There is no support group organization. In addition group work tools are not used to improve the experience of group learning.

Consequently, students do not generally see other participants on the course as elements of interest (teacher included). Interaction with the teacher is a mandatory process, useful in answering questions (usually to solve technical problems). The teacher is a kind of "low intensity" source, but is not a companion in the learning process.

We believe that the lack of group work dynamics on the online courses are a consequence of the excessive importance attached to content, to the detriment of other approaches. Also, the lack of awareness of the opportunities offered by different forms of work and assessment, and the lack of experience of teachers in group dynamic processes causes innovation to be rare.

In addition, we are part of a very individualistic organization - the University – and this is often reflected in our courses. Students and teachers work independently and in some cases in isolation; and do not have the natural dynamic of interaction crucial for learning and creativity (Muirhead, 2007). The establishment of a beneficial group work dynamic amongst teachers, and the study of this dynamic working in the teaching-learning process should be imperative if we want these processes to be fully integrated into our daily work.

It is not anticipated that all aspects of these case-studies, and the model of analysis used, could be used in other contexts. Nevertheless, some key principles that have underpinned the study of our institution should be taken into account when we study teaching innovation in general, and innovation in online teaching in particular.

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