Universal Journal of Educational Research 1(3): 209-220, 2013 http://www.hrpub.org
DOI: 10.13189/ujer.2013.010311

A Curriculum Development Route Map for a Technology Enhanced Learning Era

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Abstract In this paper we are trying to present a model of analysis that includes a comprehensive perspective of the state of the art in the specialized literature about curriculum development. From this theoretical approach, we get a complete curriculum overview. Including insights into: what are the curriculum principal elements, what we already know about didactic strategies, what are the dimensions the characterise an educational process, etc, This can be used as a route map for teachers or designers that are approaching for the first time to the complexity of a teaching-learning process. In addition, and as we have tested in the validation process of this, it is a useful tool for curriculum analysis, assessment guide for educational practices, as well as check list for curricular implementing taking decision processes. Using this, the planning process and the professional development of teachers will be improved, and may inspire improvement in teaching and learning models. In the end, it can be used as a metacognitive tool for teaching.

Keywords Curriculum Development, ICT, Analysis, Curriculum Design, Technology Enhanced Learning

1. Introduction: A Model to Understand the Current Map of the Curriculum Development

From the scientific literature, it is quite evident, that in the last years we have made several improvements in the understanding of crucial factors that determine designing, development and implementation of technology enhanced learning processes in education. Nevertheless, from our point of view, we still do not have a complete global analysis tool that combine what we already know –and it is included in our literature- from the educational technology research and from the field of learning design and curriculum development.

According to Cabero (2004), today, more than ever before, it is a priority to analyse educational designing processes, didactic interactions in classrooms, educational resources and media, didactic tools, strategies and techniques to use, effort invested, and roles assumed by participants at any technology enhanced learning process. For us, try to build and use practically valid tools that help us to assess and monitor educational processes in a wide open approach that allows us to expose and measure the effects of the use of ICT in education, is a continuous challenge. In the same way that is a challenge understanding the pedagogical points of view that underlie some ICT implementation processes (Seng-Eng, 2005; Kahiigi et al, 2008).

As a consequence, in this paper we are trying to present a model that includes a complete perspective of the state of the art about curriculum development in teaching-learning models, based on the specialized literature regarding this.

The building of this framework started from the need to have a single concentrated and systematic diagram that would represent the curriculum, not only the specific characteristics of its particular elements, but also the relationships between those elements and the curriculum as a whole, as an entity; as well as the characteristics of those in this era when some relevant changes in terms of educational technologies have happened.

Therefore, we started the process with a deep literature review that allowed us to built a very complete curriculum overview. This included: the curriculum principal elements, what we know about didactic strategies, the dimensions the characterise an educational process, and so on. This is the main part of the work we present on this paper. The model can be used as a route map for teachers or designers that are approaching for the first time to the complexity of a teaching-learning process.

In addition, in this paper we mention the way in which this model has been empirically validated, analysing with this the online courses developed in a Higher Education Institution in two different periods, trying to made palpable that it would be useful as a tool for curriculum analysis, assessment guide for educational practices, as well as check list for curricular implementing taking decision processes.

We believe the planning process and the professional development of teachers will be improved, through using

this model, and that it provides inspiration for the improvement of teaching and learning. It can be used as a metacognitive tool for teaching practice.

2. A Theoretical Approach: The Model

Consequently with the needs we have previously mentioned, we have built a model of curriculum development analysis based on a critical literature review of the scientific production regarding this topic in a wide-open perspective.

The model at presently conceived (Figure 1), understands that a global perspective around the curriculum has three basic domains or focuses of attention where the elements developed in a educational experience interact and influence mutually (from top to bottom of the figure 1):

- The Curriculum Framework
- The Direct Participants in Curriculum: teachers and students
- The Curriculum Process itself or the "classroom" experience

Those foci represent an going iterative process involving both thought and action, and are defined in the curriculum design moment, but also could be modelled with the students interaction and the daily dynamic of the classrooms.

Moreover, the way in which those elements and focuses are organized and defined by teachers and students during the design and development of the educational process, as well as the way in which technology is included on this, could operate in the definition of the basic dimensions that characterise the process itself. Following Salinas (2004:1) we believe that in education "each technology, or combination of them, configure their own grid reference", in which every system element is affected.

These dimensions, defined by the combination of the elements that work in curriculum, are planning, interactivity, flexibility, and virtuality (represented in the bottom of the figure 1).

- *Planning*: the design of the curricular process is intrinsic every curriculum proposal and affects crucially to any educational process. According to Goodyear (2005), the term curriculum design includes "the set of practices involved in constructing representations of how to support learning in particular cases" so, the term planning would be understand as the activity of anticipating the way in which teaching and learning will be organized. The decisions taken on this process are crucial, even when this activity is not always a conscious process (Toohey, 1999; Goodyear, 2005; Conole et al., 2008).
- *Interactivity:* understand the level and intensity of the interaction between participants (cognitive interactivity) and between participants and technology (instrumental interactivity) in every communication process (De Kerchove; 1999; Prendes, 2004), is essential in order to analyse better the process itself. If an educational process is a specialized communication process, trying to define better the communication characteristics that occurs within it would be very relevant to analyse, plan or evaluate it.
- *Flexibility:* According to Salinas (1999), curriculum elements and their development will define how the organization and methodology are more or less flexible in any educational process. The author understands that if we see how the 5 basic components of flexibility: the technological component, the institutional component, the didactic component, the use of educational resources and the open learning elements. These are integrated in a particular proposal or practice, we could understand better how flexible is this (Salinas, 2004).
- *Virtuality:* when we talk about virtuality as dimension of a technology enhanced educational process we understand the term as "the way in which an educational proposal is embodied on the virtual environments" (Martínez & Prendes, 2003). So, when we talk about the level of virtuality in an educational process, we refer to how the educational dynamics integrate the 4 V's of the Internet age (Moore, 2000); it means, Volume (how much of the course is done on the Internet), Velocity (how fast is the Internet integrated into the course), Variety of formats (and tools that are used on the course development) and Value (for which purpose is integrated Internet in the course).

Those are the dimensions defined by the interaction of every element, from the three foci, of the curriculum.

Nevertheless, the model we have generated from the literature review is more complex than this general overview. We wanted to see the elements that arrange each focus, as well as the possible relationships between all the elements and focuses. Furthermore, we wanted to identify the elements, included in the map, that has been evidently modified or redefined in literature as a consequence of the ICT development.

Therefore, we have developed a more detailed vision of the model (Figure 2). In this version, the relationships between different elements have been made explicit using arrows and connections (basically relationships of reference to and condition by) in a conceptual map. In addition, we have included the elements related to each focus, and we have identified, using orange squares, those aspects that appear in literature as evidently affected by the development of ICT.

As we can see in Figure 2, the model does not privilege a fixed relevance between the focuses and, even when the relationships between focuses, elements and sub elements are evident, there is not prefixed any hierarchy between them, understanding they are all in the same level of importance and are also identically influent on the definition of the educational process.

The main core of this model is expressed on this map, and is fixed by the three foci and the dimensions defined by the relationships and development of their elements. However, the elements that constitute the focuses are bigger and almost each one of those elements would be further sub-divide on subcategories or key aspects that has been fixed in the literature.

This "horizontal" perspective regarding the focuses where curriculum is defined and the elements that define those focuses, contrasts with other more "classical" views about curriculum and curriculum planning that understand it as a more linear sequence of decisions, only referred to the classroom and the teacher planning (John, 2006).

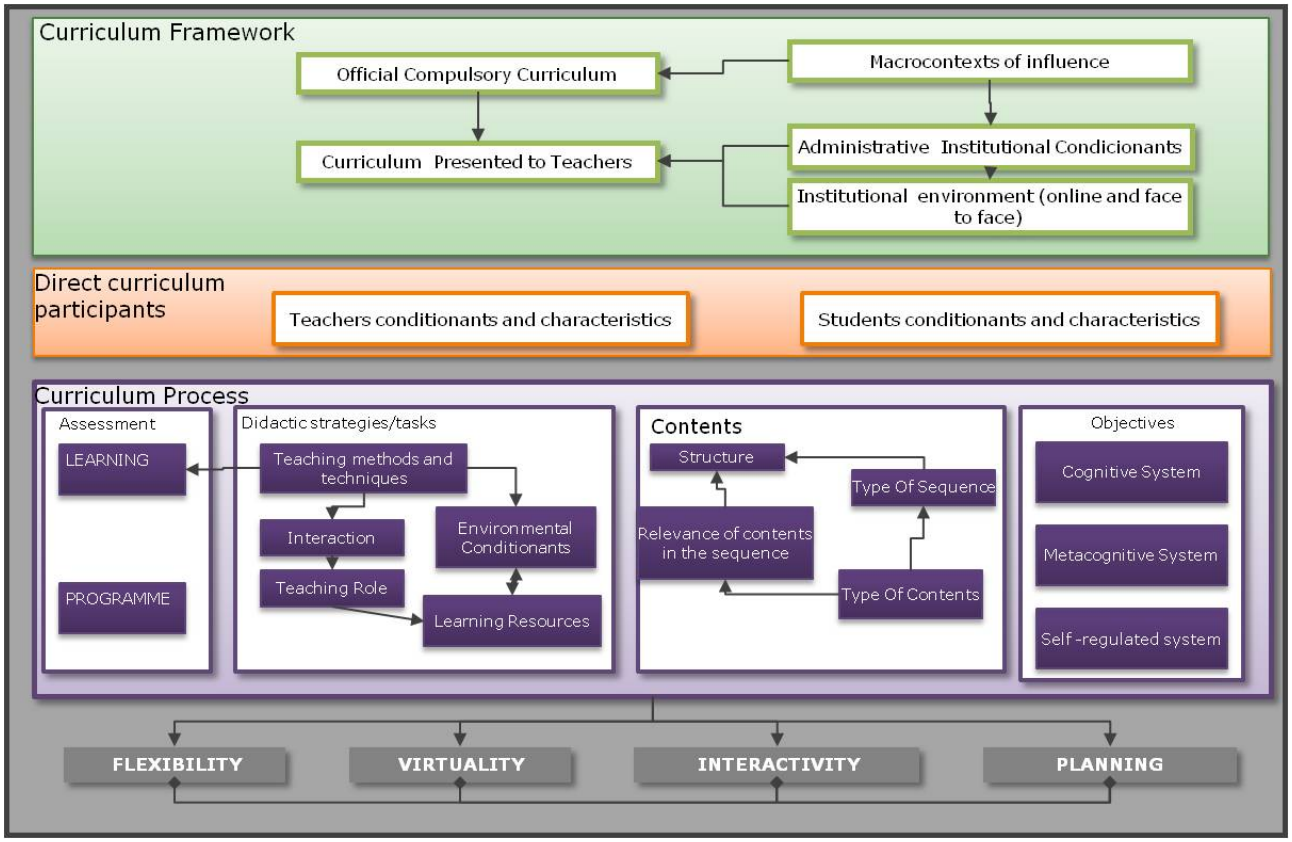

Figure 1. Model of Curriculum Analysis. Overview.

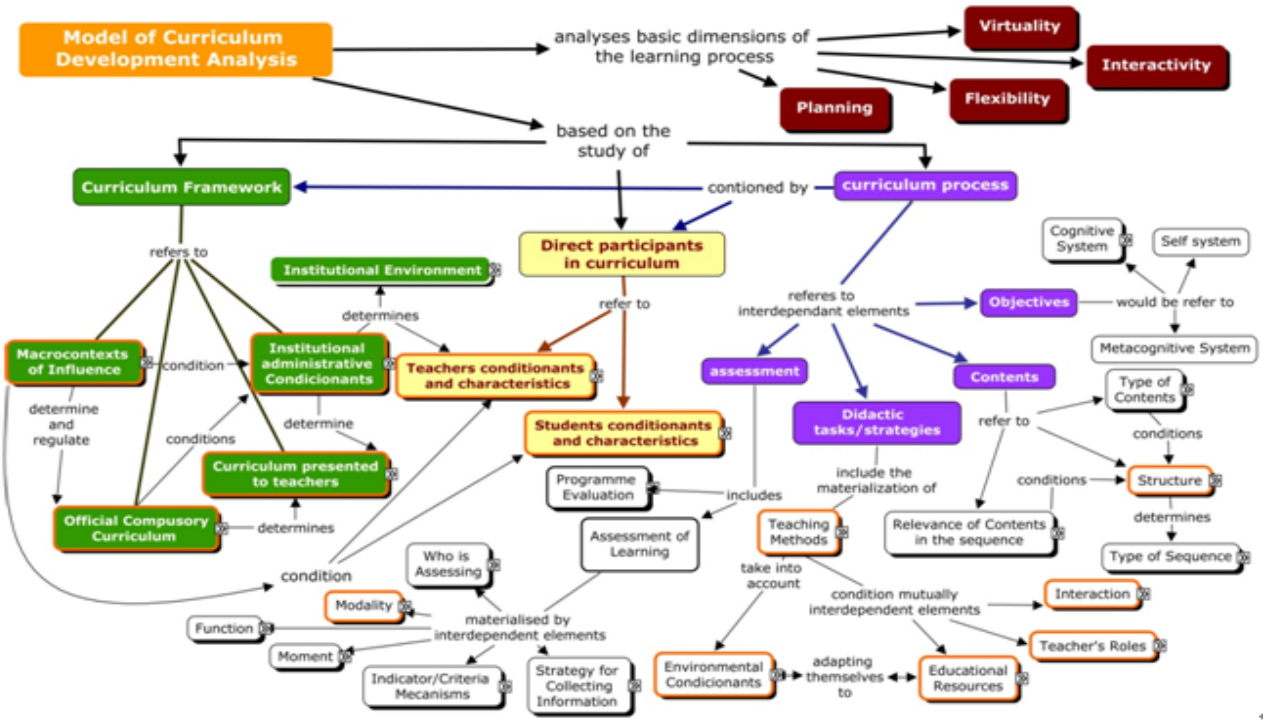

Figure 2. Model of Curriculum Analysis: Elements and Relationships. Conceptual Map.

This map can be used as a first route map in the way of understanding how to design an educational process rationally. Or can be helpful in order to define the dimensions and elements to study in order to reflect around a specific practice.

Nonetheless, in order to study the specific elements that configure each one of the foci integrated in the curriculum, we have to delve on those foci closer. And this has been the next step in the exploration of the model, partial views with more detailed information around each focus and its components. On these "partial views" of our model we continue using the same codes for understanding how are the elements, the crucial relationships between them are represented by arrows and the elements that currently appear as more affected by ICT in the scientific literature we have reviewed are in orange.

2.1. The Curriculum Framework

Curriculum is a construction and a reality determined by social contexts of influence in which it is embedded (Escudero 1999, Kelly, 2009). Those contexts condition and determine the curriculum, and the elements that operate on them, both functional and structural, configure the *curriculum framework* in which the curriculum take place and is developed, even when this framework is not directly affected by the curriculum participants actions, attitudes, skills or hopes.

In the previous part we have express that the model we propose do not express any hierarchy between the elements that are included on it. Nevertheless, in the specific case of the curriculum framework, it is quite evident that the elements that operate within this are normally influenced from the top (politics and power spheres) to bottom (schools and classrooms).

On this framework we could include firstly, some factors that influence the curriculum but are further from school or classrooms, what Kelly (2009), Bishop (1985) and Escudero (2004) called *macrocontexts of influence*. These factors represent probably the main sources of pressure on the planning and curriculum development and, even when the majority of them are completely outside the educational system, they represent the cradle on which curriculum is born. The authors include on this macro contexts: the philosophical and political factors (educational goals, ideology, and so on), the economical aspects, the social and cultural aspects (language, culture, believes), the epistemological believes (what is valuable of being known), ethics (behaviour and moral model), historic, psychological, technological aspects, among others.

Secondly, we have to include on the curriculum framework, what we could call, the *current accepted learning model*, or the educational model that has been defined from the macrocontexts of influence and the regulation and laws that express this regulation at different levels (transnational, national, regional and so on.). And then how this model is transformed and specified for any institution and constitutes the *curriculum* as it is *presented to teachers.*

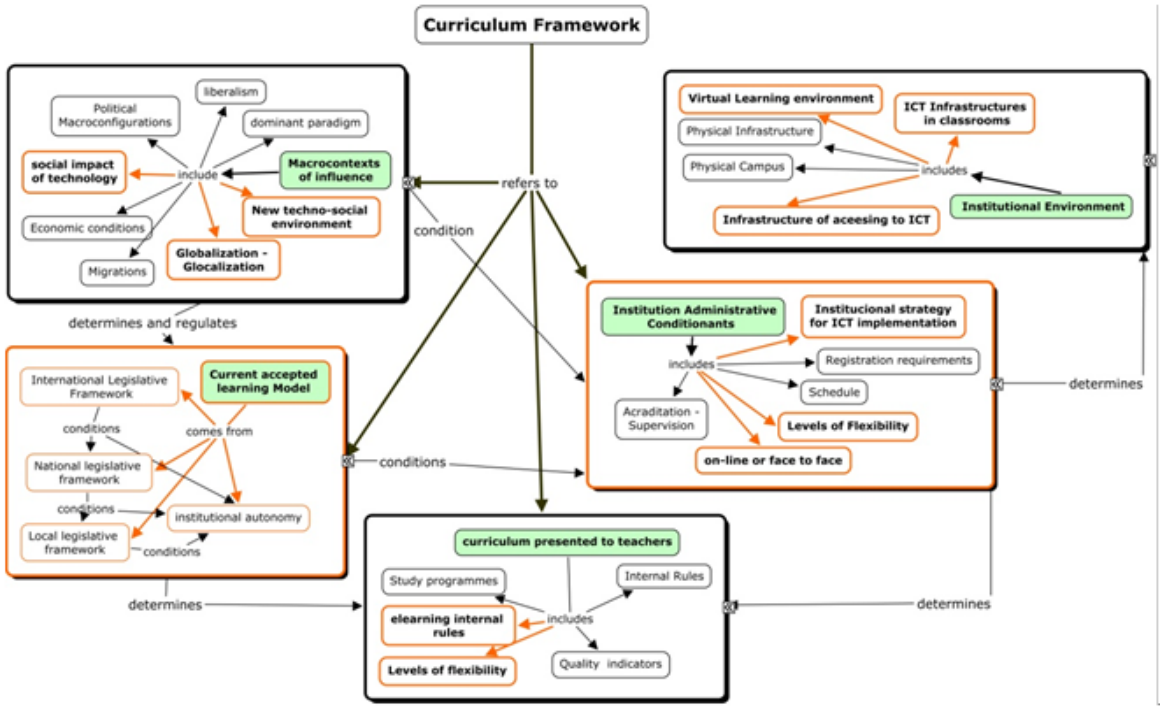

Figure 3. Model Partial Vision 1: Elements that configure the Curriculum Framework

Additionally, in the curriculum framework we could include what Pratt (1980) called the institutional environment, which defines the *Institutional Administrative Conditions* in which the curriculum has to be organized (timing, structure, tradition, and so forth), as well as the *Curriculum Environments* in which the educational experience takes "place", the face to face environment conditions –infrastructure of the city, institutional infrastructure, institutional culture, weather, mood, among others (Zabalza, 1987)- as well as the virtual environment conditions -LMS, bandwidth, tools to communicate, and so on (Martínez y Prendes, 2003; Salinas, 2004).

2.2. Curriculum Participants: Characteristics and conditionants

Teachers and students, as curriculum actors and participants, are both fundamental part of the curriculum itself. They crucially condition it and are crucially conditioned by this.

Consequently, it is important to understand their characteristics, their previous knowledge, their situation with respect to the curriculum framework, the relationships between them, their personal and psychological characteristics, their expectations, goals, wishes and so on (Pratt, 1980; Taylor, 1975; Airasian, 1971). Additionally, it is important to understand the relationships of the curriculum actors with the current technologies, variables related to their age, technological skills, digital literacy, attitudes as well as previous training for using them, which some authors call the "participants' technological moment" (Cabero, 2004) and that have some interesting perspectives to analyse in the work of some authors as Prensky (2001) or White & Le Cornu (2011).

2.3. Curriculum Process

Basically, the elements that constitute what we have included on this focus are those that configure the external view about what happens in education, the "classroom experience".

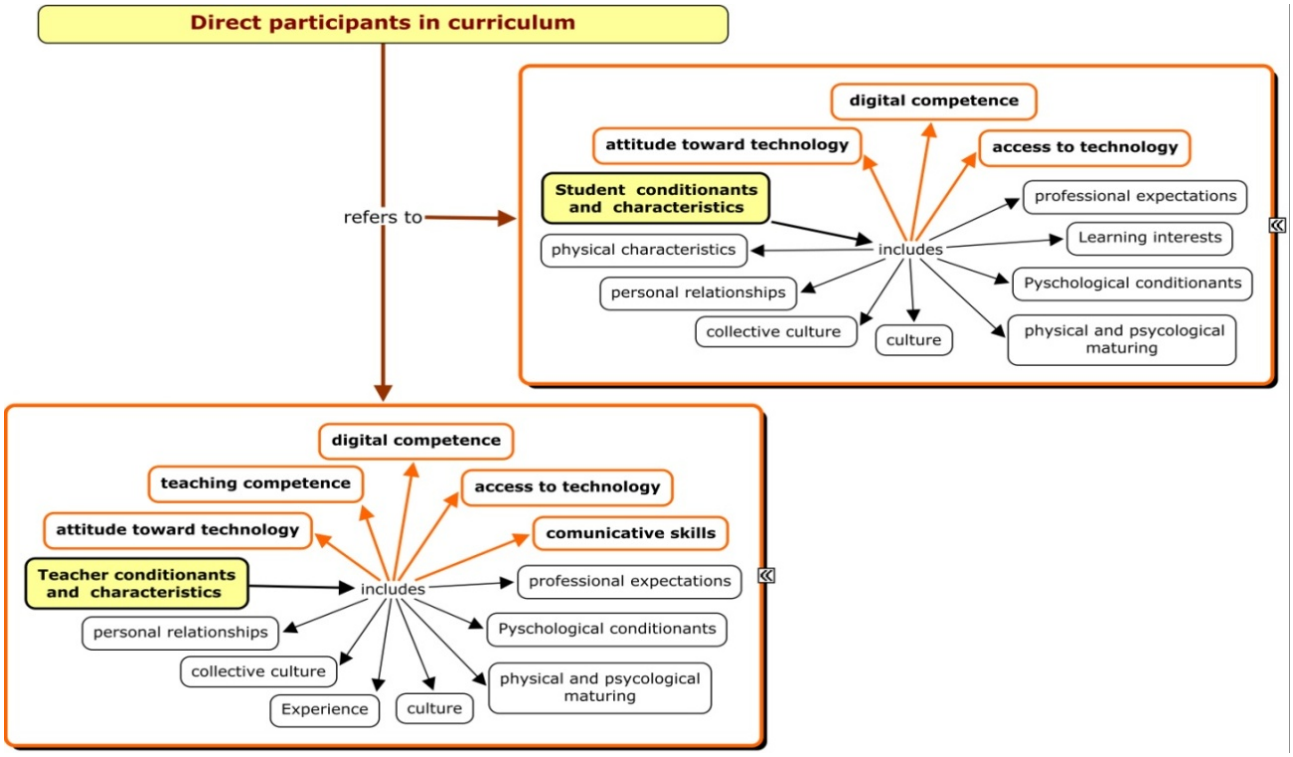

Figure 4. Model Partial Vision 2: Direct participants in curriculum: conditionants and characteristics

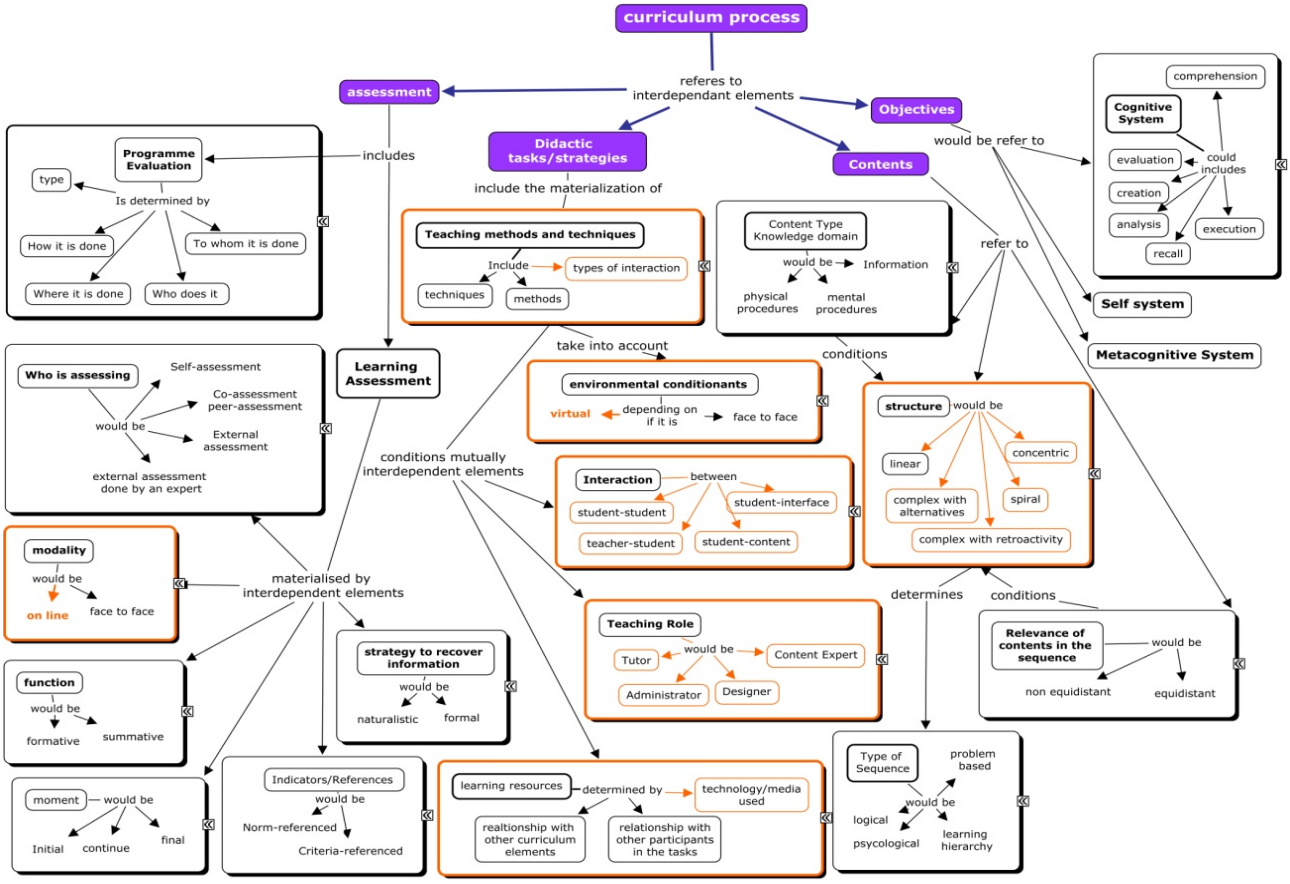

Figure 5. Model Partial Vision 3: Curriculum Process

In this case, more elements constitute this focus of attention and they are much more complex and complicated; not in vain, they has been considered, in the majority of perspectives about what is curriculum, the curriculum itself (John, 2006).

Basically, we have divided the classroom experience into 4 main sub-focuses of analysis: Assessment, Didactic tasks and strategies, Contents and Objectives or goals. Nevertheless, we have tried to conserve the "horizontal perspective" we have referred before, so. from our point of view, is not relevant to have a prefixed road across them, as sequence to follow, but to be conscious about all of them and their particularities, in order to use the model as a tool.

Then, it is crucial to understand the goals we have in any educational process, if the objective of the process is to achieve a competence, or the methodology is the *objective*, or if the *contents* are considered as objectives by themselves (Rowntree, 1974). We have to understand –or decide- what type of objectives we want to achieve, or to what domain or system -cognitive, metacognitive or self-system- those objectives are more related to (Bloom, B.S. et al., 1956; Krathwohl, et al. 1964, Marzano et al., 1988; Marzano, 1998; Marzano & Kendall, 2007).

Additionally, we have to understand how we want to achieve the objectives, the kind of *sequence* we want to follow. For example, building on Gagné (1965), Rowntree (1974) and Toohey (1999) work, we have to understand firstly the modality of the sequence, if it is logical, psychological, based on a learning hierarchy or based on projects or problems. Also, we would have to analyse how relevant is each one of the contents included on the sequence regarding to the other contents and if they are equidistant or not (Zabalza, 1987); and following the same Zabalza, what kind of structure has this sequence.

Moreover, the partial view of the model we present (Figure 5) indicates the importance of the didactic tasks and strategies on the process, and how them are carried out in the curriculum. We consider vital analyse how the classroom experience is almost always determined and mediated by the academic tasks (Doyle, 1983; Marx & Walsh, 1988; Gimeno, 1988) and the didactic strategies –that include methods, media and technics- used on them (Salinas, 2004). This analysis takes on greater importance if, as we see remarked in the chart (orange squares), is where is more obvious the impact of ICT.

Tasks and strategies, as terms, allude to practice, to what is happening on teaching and learning and to how participants acts on the process, therefore we are going to use them together as umbrella for covering some crucial elements of the curriculum analysis, as techniques –as the classified by Paulsen (1995)-, methods -with the classification of Joycel & Well (2002)- and interactions (Gisbert et al 1997; Martínez & Prendes, 2003).

Following the works and proposals from Berge (1995),

Duarte (2003), Salinas (2003) or Gisbert et al. (1997), is also basic to analyse the role that a teacher assumes on the educational activity, even if –as the previously mentioned authors remarks- we take this into account in terms of function, or in terms of the nature of its action, as Downes (2010) propose. Moreover, is basic the analysis of the interaction between the elements that work on these activities (teacher-student, student- student and student-content, following Moore (2009) and students-interface Hillman et al. (1994)), in order to analyse explore their potentials and how effective they are (Swan, 2004) and how they influence the level of satisfaction of participants (Berge, 1999; Salinas, 2004).

Last in terms of the tasks and strategies, it is crucial to analyse the *environment* –physical and virtual- where the activity takes place, as well as the *educational resources* that we use on them, paying special attention to their function in the task, their format, code, structure and levels of flexibility (Cabero, 1999; Cabero, Martínez & Salinas, 2000; Salinas, 2000, 2004; Martínez, 2004, 2007; Martínez & Prendes 2003; Martínez et. al. 2002; Prendes 1996).

Finally, in exploring our model, we include on this partial view (Figure 5) the assessment as sub-focus for analysing regarding the curriculum process. According Garcia (2003), Stufflebeam & Shinkfield (2007), Pratt (1994) and Salinas, Pérez & de Benito (2008), the perspective of assessment as a students control instrument is only a very partial and restricted perspective, specially when we are trying to analyse the educational process from the 4 dimensions we mentioned before (interactivity, virtuality, planning, and flexibility). Therefore, taking into account the basic two sides of assessment: the learning assessment, as well as the programme evaluation.

In one hand, and in order to understand *the learning assessment*, it is crucial to understand how it works in order to provide feedback for students, teachers and the institution itself (Pratt, 1994). We need to know, at least, in which moment the evaluation is done –initial, continuous or final-, if it is face to face or is on the distance, if is collected in a formal or a naturalistic way (Door-bremme, 1991), if has a formative or summative function (Airasian, 1971), the mechanism and indicators –norm or criteria- that use to be completed (Thorndike, 1919 cit. in Pratt, 1994), as well as who assess and take decisions about it, if it is a self, peer to peer or external evaluation.

On the other hand, the *evaluation of the programme* takes relevance because it could provide very valuable information and feedback for almost all the participants in the curriculum, the direct participants as well as the non direct, as well as the macro-contexts of influence. Consequently, it is important, to explore how this evaluation is done, who make this, what is trying to measure or understanding, how this is done, for which purpose, as well as when the evaluation is done (Garcia 2003).

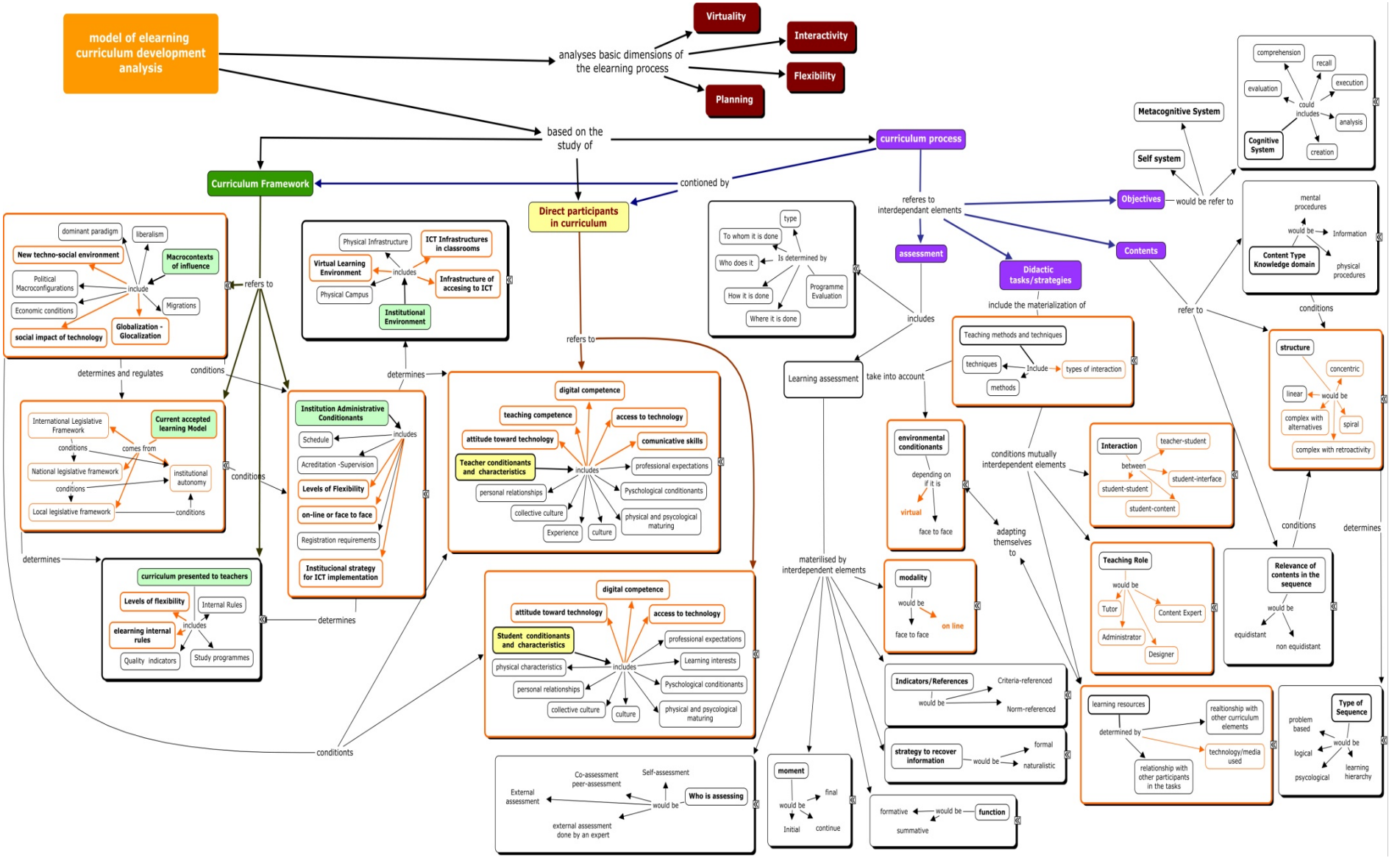

Figure 6. Extended vision of the model

3. Model Validation

As we have previously said, the model we have just presented has been built based in a literature review about curriculum development and the factors that affect this.

In addition, during the period of the model's –or the map- development, we have validated it using it as a base for analysing the model of curriculum development which underlies the online courses offered by the University of Murcia at two different times; the first version of any online course in our university, as well as the courses carried out 3 years later. The main goal of this analysis was try to understanding the model of curriculum development which underlies the online courses offered by the University of Murcia, describing and understanding the teachers decision taking and planning process in every online course, as well as the students' work on these curriculum proposals, the use of ICT tools in each one of these courses, contrasting the influence of every curriculum element of these courses as planned day to day, their results, as well as the satisfaction of the expectations of the participants. Finally, we have used the data obtained from the analysis for making proposals to improve the participant experience, the teachers' job, the ICT tools' development inside the university, as well as the institutional elearning implementation strategy.

In the assessment of the online courses of the University of Murcia, the invited sample was defined by the total of online courses in both (15 + 21 courses). This assessment was conducted under very specific conditions and each course was examined in a variety of ways and with different levels of participation.

The idea started with getting a general overview of each course. Based on the model of analysis we built (described before in The Model), we built a matrix in which we included criteria and indicators for each one of the elements of the model. With this matrix, we created a set of the data collection instruments that allow us to find and accumulate empirical evidences about the nature and characteristics of each element of analysis included on it, evidences collected from teachers, students, the course planning, the course development, the statistics, and so on.

With these, we have tried to combine the three sources of information that we discussed previously (teachers, students and flow of information), combining, in addition, the use of qualitative instruments (such as portfolios and interviews) and quantitative instruments (e.g. questionnaires or statistical reports) and, of course, gathering information from all the indicators which have been proposed as pointers of the curriculum elements to analyze.

According to this, we had to plan an assessment process which included every one of these elements. Therefore, we decided to organize the assessment –especially data collecting- into four stages; and based on these stages, and once the criteria and indicators that support the intended analysis were defined, we developed a forecast of what instruments of collection of information that could help us, and their features:

General information
- Documentary review
- Statistical data

Initial Evaluation
- Initial teacher interview
- Initial student questionnaire

Continuing assessment
- Student portfolio and anecdotal evidence
- Teacher portfolio and anecdotal evidence
- Review of the LMS statistics
- Review of instruments and criteria of learning assessment

Final Evaluation
- Final teacher interview
- Final students questionnaire
- Final LMS statistical analysis

Consequently, the kind of assessment we attempted to carry out and the wide variety of data collection instruments we designed, have made it extremely difficult to define the participant sample.

Indeed, at the end of the data collection period, we had data from every course of the first period and from 18 courses (of 21) of the second one. The other three did not give us permission to obtain even automatic data provided by the University's LMS. Consequently, our participant sample was therefore configured by 33 courses, from five of the eight areas of knowledge included in the UM.

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

Table 1. ata collection instrument collected. Information

Collecting data instrument /	1st	2nd	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
LMS Statistics	15	18	33

4. Some Results: What We Know Now Around the Model

Once all the analysis processes are finished, we believe that we have not just proposed a strict model of the analysis of curriculum development. More than this, from our point of view, we have built a current map of curriculum, where we have tried to synthetically include the current situation of the curriculum in the specialized literature, including its design and its development. It includes, of course, changes caused or highlighted by ICT as a vital part of the present society, and consequently of education.

We believe that the proposed model has been validated in this work. Once the elements of the curriculum of our 33 online courses has been analysed, we have obtained a general overview about them and the element that characterize their curriculum model. The elements included were relevant in order to understand how this courses work and the curriculum become into reality. Therefore, the model has been work as an integrated model that brings together in a single analytical tool, all the curriculum elements to be considered in a model of teaching using ICT. Everything is in one entirety. It should be taken for granted that we understand that this is only an extension of the issues already covered in previous models.

For example, these view, offered a perspective that indicate -from the analysed courses- that there are no objectives, contents, tasks or assessments with different characteristics from those already seen in traditional models. In spite of having been included in the analysis model, and having appeared extensively in the literature, new forms of enunciation of objectives, contents, teaching strategies and new forms of organization of working do not appear in the proposals made in the huge majority of the online courses analysed. The only area where some changes are made is assessment, where unreliable formative assessment appears and, but only in some cases, the naturalistic collection of data for assessment.

It is crucial to emphasize the importance of teachers' awareness of the innovative power of the curriculum elements. It is imperative that teachers understand that each of the curriculum elements determines innovation, and that as long as we continue to use them and plan in the same traditional way, even when this is carried out using ICT, there is no substantive innovation in curriculum. It would probably be interesting to include the analysis of "new" ways to organize the curriculum elements in teacher training: new types of objectives, organization and improvements introduced to courses and new ways to assess, teaching complex sequences, and the impact of their use on different areas of knowledge and courses.

This is a model that is intended to reflect all the aspects analyzed. More than a technological change, a methodological change has been made possible for education and for the construction of knowledge. This change is partially due to technical development and partially due to the new theoretical and pedagogical concepts that have appeared parallel to the techno-social evolution that surrounds us.

We also believe that the model integrates all these new dimensions into the elements already known. It provides an important final analysis based on the study of each of these elements. This is why we classify courses as more or less flexible and more or less interactive. It is part of a detailed analysis of the elements, but also leads to a more inclusive overview.

Finally, we believe that the model is not only useful in analysing the development of curriculum; it may be useful for teachers as a route map, which has different potentials for the learning process. Using this, the planning process and the professional development of teachers will be improved, and may inspire improvement in teaching and learning models. In the end, it must be used as a metacognitive tool for teaching practice.

The main goal of this work never has been the proposal of a universal model, nor a radical change in approaches to any of the elements of curriculum. In spite of this, we wanted to systematically organize everything that occurs in curriculum at the current pedagogical and technological time; always beginning with the specialized scientific literature. This continue being our objective, and we are aware that at the same time as we are writing the present study, statistics and plans are appearing, which must be taken into account when considering the study.

However, we still have several questions. One of the most obvious, and the one that has given us the most thought, is related to the need for and / or the appropriateness of including course results (institutional course evaluation as well as students' marks) in the analysis. We understand that student results are indicative of many things, but we do not want to hazard what type of indicators they are or what evident relationships with curriculum elements they have. The same problem is with institutional results of courses. So let us leave some questions unanswered. They are: "Should the model include an analysis of the results, and on what terms?"

5. Further Steps

We believe, in the light of this study, as well as the validation of it, that the first draft of the model of the curriculum has been achieved. Nonetheless there is quite a major problem underlying this. This theoretical model is too far removed from the development of real curriculum. Teachers do not have the minimum of competences related to the curriculum elements and its development. Once ICT provision, connectivity and usability are not the main problems any longer (as we could observe n our schools and universities), the basis for a teacher training exclusively based on technical skills has to appear as rather unsatisfactory.

Teachers are competent with the use of ICT tools. The level of knowledge is actually quite basic but it can improve with practice. Nevertheless, teachers continue without any basic knowledge of pedagogical concepts, and even worse, they continue thinking that they even do not need them.

Additionally, as we have remarked previously – and as is quite evident in the extended version of the conceptual map we have presented (Figure 6) where we can see that the elements affected by ICT are marked by an orange line in the graphic-, we can appreciate that ICT influence is evident almost only in aspects related to curriculum framework and conditions of the participants. However, in aspects related to the curriculum process the influence is quite minor. So, in the classroom experience elements described by literature, ICT

appear as only important in elements related to teaching techniques and strategies and also, but in an almost anecdotal way, in the modalities of assessment and the structure of contents. In all the other aspects of the curriculum process the base of the literature reefers to research and studies carried out long before the appearance of ICT (serve as an example the state of almost continue review around Bloom's taxonomy, from 1956, without proposing nothing radically different).

For this reason, the study of these issues from a new perspective becomes imperative for the future. Continue developing "new" curriculum models based on old-fashioned approaches and for our technological and social era, is difficult to defend. In the same way, expecting changes in the direction of flexibility in the whole curriculum structure, without studying in depth elements that sustain it, is –at the least- frivolous.

In a world that is the victim of a process of "infoxication", learning models, even online learning models, continue to be based on contents, and use ICT tools only as a channel. The Internet is understood to be nothing more than a tool able to be used in students' homes. The possibility of including models based on tasks as well as based on valuable activities in learning processes would be an interesting possibility to explore, models that study the curriculum development with technology (inside, outside and around it); models where the networks could be understood not as more than as a tool, but not less than this.

Therefore, we believe that understanding online courses and face-to-face courses as two completely different situations is a more and more artificial division. In the same way, understanding learning without technology as a transversal factor is also artificial. Consequently the study of curriculum in integrated vision is a necessary further step, where the appreciation of learning situations and interactions – and the elements that configure them- could be perceived in a world of interactions affected by technologies. The technology enhanced curriculum.

Studies need to continue incorporating and encourage perspectives that do not understand technology as a variable that affects only –or some- part of the curriculum. This is crucial to understand ICT as a variable, which transversally affects education, and in consequence the whole curriculum system dependant on this.

This work has been only the first examination of the current situation, but a lot, we believe, is yet to be explored. A lot with which to make more ambitious proposals which could include complex teaching models, understanding of new concepts of how to teach and learn and other perspectives of spaces in which a clear distinction between what is virtual and what is face to face could become be blurred.

REFERENCES

[1] Airasian, P. W. (1971). Mastery learning: Theory and practice. New York, Holt, Rinehart and Winston.

[2] Berge, Z. L. (1999). Interaction in post-secondary web-based learning. Educational Technology, 39(1), 5-11.

[3] Bishop, G. D. (1985). Curriculum development : A textbook for students. London: Macmillan.

[4] Bloom, B. S., Englehart, M. F., Furst, E., Hilt, W., & Krathwohl, D. (1956). Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain. New York, Toronto: Longmans, Green.

[5] Cabero, J. (2004). La investigación en tecnologías de la educación. Bordón: Revista De Orientación Pedagógica, 56(3 and 4), 617-634.

[6] Cabero, J., Martínez, F., & Salinas, J. (2000). Medios audiovisuales y nuevas tecnologías para la formación en el siglo XXI. Murcia: Diego Marín.

[7] Conole, G., Cross, S., Brasher, A., Weller, M., Nixon, S. & Clark, P. (2008). 'A learning design methodology to foster and support creativity in design', paper accepted for the Networked Learning Conference, Greece, May, 2008.

[8] De Kerckhove, D. (1999). Inteligencias en conexión. Hacia una sociedad de la web. Barcelona: Gedisa.

[9] Door-Bremme, D. W. (1991). "Naturalistic Evaluation". In A. Lewy, (Ed.), International Encyclopedia of Curriculum. New York: Pergamon.

[10] Doyle, W. (1983). Academic work. Review of Educational Research, 53(2), 159-199. Retrieved from http://www.jstor.org/stable/117038.

[11] Duarte, A. (2003). Principios para el diseño de materiales de teleenseñanza. In F. Martínez (Ed.), Redes de comunicación en la enseñanza (pp. 183-208). Barcelona: Paidós.

[12] Escudero, J. (1999). Diseño, desarrollo e innovación del curriculum. Madrid: Síntesis.

[13] Escudero, J. M. (2004). La educación, puerta de entrada o de exclusión a la sociedad del conocimiento. In F. Martínez & M. P. Prendes (Eds.), Nuevas tecnologías y educación (pp. 25-58). Madrid: Pearson.

[14] Gagné, R. (1965). The conditions of learning. New York: Holt, Rinehart and Winston..

[15] García, M. P. (2003). La Evaluación de Programas en la Intervención Socioeducativa. Murcia: Diego Marín.

[16] Gimeno, J. (1988). El curriculum : Una reflexión sobre la práctica. Madrid: Ediciones Morata.

[17] Gisbert, M., González, A., Giménez, B., Ponce, C., Contijoch, M., Lladó, F., Güell, M., Adell, J., Nofre, E., & Fabra, M. (1997). El docente y los entornos virtuales de enseñanza-aprendizaje. In M. Cebrián. (Ed.). Recursos Tecnológicos para los procesos de Enseñanza y Aprendizaje. ICE/Universidad de Málaga: Málaga. 126-132.

[18] Goodyear, P. (2005). Educational design and networked learning: Patterns, pattern languages and design practice. Australasian Journal of Educational Technology, 21(1), 2.

[19] John, P. D. (2006). Lesson planning and the student teacher: Re‐thinking the dominant model. Journal of Curriculum

Studies, 38(4), 483-498. doi:10.1080/0022027050036362.

[20] Joyce, B. R., & Weil, M. (2002). Modelos de enseñanza. Barcelona: Gedisa.

[21] Kahiigi, E., Ekenberg, L., Danielson, M., & Hansson, H. (2008). Exploring the e-learning state of art. Electronic Journal of E-Learning, 6(2), 149-160.

[22] Kelly, A. V. (2009). The curriculum: Theory and practice. London: Sage Publications Ltd.

[23] Krathwohl, D. R., Bloom, B. S., & Masia, B. B. (1964). Taxonomy of educational objectives. Handbook II: Affective domain. New York. Toronto: David McKay.

[24] Martínez, F. (2007). "La Integración Escolar De Las Nuevas Tecnologías. In J. Cabero, (Coord), Nuevas Tecnologías Aplicadas a la Educación. Madrid: McGrawHill.

[25] Martínez, F., & Prendes, M. P. (2003). ¿A donde va la educación en un mundo de tecnologías? In F. Martinez (Ed.), Redes de comunicación en la enseñanza: Las nuevas perspectivas del trabajo corporativo (pp. 281-300).

[26] Marx, R. W., & Walsh, J. (1988). Learning from academic tasks. The Elementary School Journal, 88(3), 207-219. Retrieved from http://www.jstor.org/stable/100195.

[27] Marzano, R. J. (1998). What are the general skills of thinking and reasoning and how do you teach them? The Clearing House, 71(5), 268-273.

[28] Marzano, R. J., & Kendall, J. S. (2007). The new taxonomy of educational objectives. Thousand Oaks, CA: Corwin Press.

[29] Moore, D. (2000). The changing face of the infosphere. Internet Computing, IEEE, 4(1), 75-76.

[30] Moore, M. G. (2009). Editorial: Three types of interaction. American Journal of Distance Education, 3(2), 1-7. doi:10.1080/0892364890952665.

[31] Pratt, D. (1980). Curriculum, design, and development. New York: Harcourt Brace Jovanovich.

[32] Pratt, D. (1994). Curriculum planning : A handbook for professionals. Fort Worth: Harcourt Brace College Publishers.

[33] Prendes, M. P. (1996). El multimedio en entornos educativos. In C.M.I.D.E. (Ed.), Medios de comunicación, recursos y materiales para la mejora educativa II, Sevilla: Ayuntamiento de Sevilla.

[34] Prendes, M. P. (2004). 2001 odisea en el ciberespacio. In F. Martinez & M. P. Prendes (Eds.), Nuevas tecnologías y educación (pp. 171-94). Madrid: Pearson.

[35] Prensky, M. (2001). Digital natives, digital immigrants part 1. On the Horizon, 9(5), 1-6.

[36] Rowntree, D. (1974). Educational technology in curriculum development. London: Paul Chapman Pub. Ltd.

[37] Salinas, J. (1999). Enseñanza flexible, aprendizaje flexible, aprendizaje abierto. Las redes como herramienta para la formación. Edutec Revista Electrónica De Nuevas Tecnologías, 10.

[38] Salinas, J. (2000). Criterios generales para la utilización e integración curricular de los medios. In J. Cabero (Ed.), Tecnología educativa (pp. 107-29). Madrid: Síntesis.

[39] Salinas, J. (2003). El diseño de procesos de aprendizaje cooperativo en situaciones virtuales. In F. Martínez (Ed.), Redes de comunicación en la enseñanza: Las nuevas perspectivas del trabajo corporativo (pp. 157-82). Barceloa: Paidó.

[40] Salinas, J. (2004). Innovación docente y uso de las TIC en la enseñanza universitaria. RUSC. Revista De Universidad Y Sociedad Del Conocimiento, (1), 1-16.

[41] Salinas, J. Pérez, A. Y De Benito, B. (2008). Metodologías centradas en el alumno para el aprendizaje en red. Madrid: Síntesis.

[42] Seng-Eng, T. (2005). The impact of ICT on learning: A review of research. International Education Journal, 6(5), 635-65.

[43] Stufflebeam, D. L., & Shinkfield, A. J. (2007). Evaluation theory, models, and applications. San Francisco: Jossey-Bass.

[44] Swan, K. (2004). Relationships between interactions and learning in online environments. The Sloan Consortium.

[45] Taylor, P. H. (1975). Aims, influence, and change in the primary school curriculum. Windsor: NFER.

[46] Toohey, S. (1999). Designing courses for higher education. Buckingham [England]; Philadelphia, PA: Society for Research into Higher Education & Open University Press.

[47] White, D. S., & Le Cornu, A. (2011). Visitors and residents: A new typology for online engagement. First Monday, 16(9-5).

[48] Zabalza, M. (1987). Diseño y desarrollo curricular. Madrid: Narcea.