

Reflections about the pedagogical models of university education in virtuality

Reflexiones acerca de los modelos pedagógicos de la educación universitaria en la virtualidad

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ABSTRACT

This article has the intention of redefining the importance of pedagogical models in Virtual Education are presented. To this end, a broad qualitative documentary approach was developed, with a descriptive approach based on a hermeneutic-historical method that allowed knowing the theoretical, epistemological and technological aspects associated with the current virtual university pedagogical models at first, to then contrast with the compilation of experiences in the international arena regarding these articulation processes and their relevance in training programs, focused on revealing new formulas that raise the excellence of Higher Education.

Keywords: Higher education; Pedagogical models; Virtual education; TIC

RESUMEN

En el presente artículo, tiene como intención resignificar la importancia de los modelos pedagógicos en la Educación Virtual. Para ello se desarrolló un amplio abordaje documental de corte cualitativo, con enfoque descriptivo basado en un método hermenéutico-histórico que permitió conocer los aspectos teóricos, epistemológicos y tecnológicos asociados a los actuales modelos pedagógicos virtuales universitarios en un primer momento, para luego contrastar con la recopilación de experiencias en el ámbito internacional frente a estos procesos de articulación y su relevancia en los programas de formación, enfocado en revelar nuevas fórmulas que eleven la excelencia de la Educación Superior.

Palabras clave: Educación superior; Modelos pedagógicos; Educación virtual; TIC

INTRODUCCTION

UNESCO (1998) in its world report on education, points out that virtual learning environments constitute a totally new form of educational technology and offer a complex series of opportunities and tasks to educational institutions around the world.

These virtual learning environments according to Sánchez (2011), *“are spaces configured in telematic networks, which group together a considerable set of tools that allow the diversity of forms of synchronous and asynchronous communication: forum, chat, email, discussion lists or distribution, wiki, blog, videoconference, audioconference, audiographic conference, among others, as it facilitates, expands and diversifies the variants of professional improvement thanks to the flexibility in times and spaces, in order to enable continuous training”*. (Sanchez, 2011, p. 2)

In this sense, the relevance of virtual learning environments is that they can act as *“mediating artifacts between the teacher and the students or between equals that provide a unique and virtual educational context that facilitates interactive processes of co-construction of knowledge”* (Salmerón, Rodríguez and Gutiérrez, 2010, page 164)

Virtual learning environments, structurally, are based on models that, using pedagogical mediations, allow to introduce a break - temporary in the student, teacher - student relationship, and between them, establishing a dynamic of interaction conducive to independent study, achieving effectively the permanent appropriation of knowledge and skills.

In this context, the virtual pedagogical models, based on the paradigms of technology, are diversified in terms of virtual educational proposals, which are beginning to be structured, taking into account the types of communication in which they are implemented, others are established taking into account the established technology counts, while others structure it based on the functionality provided by the selected pedagogical model.

It is significant to ratify that virtual learning environments have promoted paradigm shifts, new approaches supported by current technological advances, fundamentally the role of the actors of the virtual teaching process, focused on being able to respond to the educational requirements that arise as consequence of social needs, based on new pedagogical models.

Knowledge of the new virtual pedagogical models constitutes an essential guide for teachers, by having an overview of how they are implemented, on what bases they are planned, how they operate and what are the constituent elements that play a determining role in a didactic planning. essential for the achievement of educational objectives.

DEVELOPMENT

It is based on the idea that the construction of models is one of the essential tasks of scientific work, in this sense, then, the main concepts of this frame of reference will be deepened. Before going into detail on the central topic of this article, it is important to highlight the function of the models as a preamble to the important ideas about the notion, concept and characteristics of the pedagogical models of education in virtuality.

Correspondingly and with the aim of initiating this conceptual elaboration, the word model is defined, in great synthesis, based on the definition contained in the RAE: "Theoretical scheme of a system or of a complex reality, which is elaborated to facilitate their understanding and the study of their behavior. RAE (reissue 2011)

On a more specific level, Flórez (1999) and Yurén (2000) agree that a model *"is the image or representation of the set of relationships that define a phenomenon, with a view to a better understanding"* (Flórez, 1999, p.60) and *"means to understand what the theory tries to explain, linking the abstract with the concrete"* (Yurén, 2000, p.57).

In this same direction, Bournissen (2017) theorizes, who states that a model is

"The set of concepts, principles, and procedures intended to regulate academic life with regard to its three substantive functions: teaching, extension, and research. It represents what is pursued, why and how to achieve it. An educational model encompasses the pedagogical theories that a particular institution has selected to address the education it provides to its students. These theories guide teachers and non-teachers in how the education of students should be during their time at the institution". (Bournissen, 2017, p. 46)

As can be seen, there are multiple definitions and each one focuses on particular elements. Although, in general, it is appreciated that all definitions take into account the theoretical framework system that supports it and its relationships, which represent a specific phenomenon and must be understood for its implementation in practice.

It corresponds to analyze the concept of Pedagogy, for Álvarez de Zayas *"Pedagogy is the science that has as its object the formation process, that is, the one that studies the formation, in general, of the personality of men"*. (Álvarez, 1995, p. 13)

It is significant to refer to the fact that, on pedagogy, there are many conceptions, such as that of Fullat (1992), who assumes it as *"science of education, in charge of educational discourse"*, while Guanipa (2008), defines pedagogy as a *"set of knowledge that deals with education, and as a science of a psychosocial nature linked to the psychological aspects of the child in society"*.

In general terms, pedagogy has had several conceptions, hence, some consider it an art and others believe that it is knowledge or science. In this regard, within this context, pedagogy is defined as the set of activities that are implemented in the educational field, supported by laws, principles, methods and procedures that stimulate the teaching-learning process.

On the other hand, and taking into account guaranteeing the quality of the virtual teaching-learning process, a methodology that integrates the elements that interact in teaching in this modality is very important, among them, the role of the student, the teacher, the contents, as well as learning methodologies. The articulation of all these elements in the educational process is achieved through a pedagogical model.

If pedagogy has been understood as the theory of education, which tries to explain, develop and project that educational reality through hypotheses, laws, principles, axioms and recommendations. It would seem that, in principle, as Buitrago (2013) points out

"a pedagogical model would be that space where the theory of pedagogy is put to the test. A space where hypotheses, projections, simulations and experimentations can be considered, in order to contribute to the formation of that man that society wants from an educational and/or pedagogical point of view.". (Buitrago, 2013, p. 6)

From the perspective of Zubiría (1994) a pedagogical model is:

"an instrument of the educational institutions that must make clear what is taught and what is studied for, the pedagogical intentionality and the graduate profile that is desired to be achieved; It must be explicit in the purposes and purposes to which these institutions point and seek to carry out, through educational teaching"

processes implemented in each area, these assumed as their fundamental cell".
(Zubiria, (1994), pp. 4-5)

For his part, Arreola (2012), a pedagogical model:

"It expresses the ideal of training that the educational institution intends to achieve in the students who access the programs it offers. This ideal of training, in the university environment, becomes a reality during the academic semesters, in the system of spaces of conceptualization that occur in each one of them and, more specifically, in the particular educational teaching processes to which they are taught. that the student accesses every day under the direction of a competent cultural agent: the teacher". (Arreola, 2012, p.102)

In this regard, Díaz (2011) states that "for the conception of a pedagogical model based on virtual environments, as an alternative for the pedagogical use of information and communication technologies (ICT), the dimensions must be dynamically integrated: philosophical- epistemic, socio-cultural, institutional, communicational, pedagogical and technological". (Díaz, 2011, p. 89)

For its part, Sierra (2006) states that

"Pedagogical models are educational designs that provide explicit guidance on the best way to promote learning, the acquisition of new knowledge and development in different areas. The conception of a pedagogical model allows addressing the complexity of the educational reality, while proposing intervention procedures in it, since it becomes an instrument that facilitates the analysis of the reality of the educational context with the purpose of contributing to its transformation". (Sierra, 2006, p. 2)

From the above definitions, it follows that a model is a mental construction that allows a representation of a real phenomenon or process to be made to facilitate its understanding and subsequent transformation. In the specific case of education, pedagogical models allow us to understand the educational process, since they allow us to establish the dimensions of the cognitive development of the individual, with the knowledge, experiences, practices, socio-cultural and affective relationships that are generated.

Based on the above, it is pertinent to highlight that a pedagogical model based on virtual environments is more than a definition or a purpose, therefore, it is necessary to have a

model that serves as a reference to evaluate and improve. There are many proposals, below we will analyze those that, in the opinion of the authors, represent the most significant:

The virtual campus model

According to Alfonso (2010), the Virtual Campus is technically configured as an Intranet associated with a database. This Intranet is accessible through different communication channels (basic telephone network, ISDN integrated services digital network, etc.) and facilitates intercommunication between all members of the university community.

On the other hand, Peláez and Bendito (2005), refer that

“In the virtual campus model, at least five types of actors are involved: students, professors, advisers, administrators, and technical support staff. Each of these has a defined role within the education system, without which virtual education would have a poor performance”. (Pelaez and Blessed, 2005, pp. 12-13)

In general, the virtual campus model will be made up of what have been called virtual buildings, taking as a reference the existing buildings on the physical campus and the activities that take place in them. Educational materials can range from documents to complex educational software.

The Cognitive Constructivist Model

This model indicates that “each student progressively accesses the higher stage of intellectual development”, this is done based on their experience, so it is essential that the content, the environment and the didactics adapt to the student's cognitive development.

Learning is done by the student since he is the builder of his own knowledge, based on previous knowledge and experience, relates and applies new knowledge, achieving significant learning. The evaluation is aimed at establishing the new information and understanding that the student has achieved, in this sense Flórez (1999) points out that *“it differs from behaviorism in that it emphasizes that students learn to think, reason and decide.”* (Florez, 1999, p. 12)

The virtual learning model (MAVES), based on Web 2.0 technologies

The MAVES model brings together different systems in which the referential-academic binomial is integrated, where the student is placed at the center of the model supported in their training by the education-technology, teaching-learning, content-competence

and communication-information dyads. In this way, active and collaborative learning, participatory work, the portfolio and the digital repository are modulated, through which the student creates, manages and transmits new knowledge.

The objective of the model according to Ricardo, Hugo and Martín (2010) is that

“the student chooses, analyzes, organizes, categorizes, integrates and articulates, according to the interactive social environments and their own learning routes, the information, the contents and the materials linked to the context of practice and reality (adaptive model), according to their creativity, inquiry, participation, collaborative work, digital resources, Web 2.0 tools and those that are more in line with their preference and pedagogical utility”.
(Ricardo, Hugo and Martin, 2010, p. 54)

The Pedagogical model of the Open University of Catalonia (UOC)

In this model, emphasis is placed on the three main actors of the teaching-learning process: the student, the teacher and the technological environment, in which the didactic materials, teacher's action and evaluation are proposed as key elements for the achievement of significant learning in the student. The model according to Gutiérrez (2004) “contemplates then as fundamental aspects through which learning will be achieved: the relationship between students, collaboration, the possibility of interactivity and the availability of accessible bibliographic and support resources”. (Gutierrez, 2004, p.37)

The model focused on E-activities

The model centered on E-activities is based on a student-centered learning methodological proposal, which is established in the conviction that subjects learn by “doing” and “interacting”. From this point of view, the development of “activities” that privilege practical work, in teams and related to specific situations aimed at problem solving or the development of higher order skills, is encouraged. The basis of the model is the online instructional design, which guides a rigorous and quality training process.

Silva (2017), states that

“in the model focused on E-activities, it is based on the ADDIE model (Analysis, Design, Development, Implementation and Evaluation), an interactive design process, where the results of the formative evaluation of each phase can lead to the return to any of the previous phases, the final product of one phase is the

starting product of the next, it is complemented with elements of the ASSURE model and the Kemp Model". (Silva, 2017, p. 8)

The three-dimensional model of the University of the Balearic Islands

This model is made up of three dimensions: organizational, pedagogical and technological. The organizational dimension encompasses all those aspects that traditional organizations can offer, coordinated in such a way that they are capable of adapting to the needs and requirements posed by students.

This model according to Bournissen (2017)

"It shows in a general way the properties of the teaching-learning process through new technologies, showing the relationships established between the main elements that make up the pedagogical dimension. This dimension has three subdivisions: Methodology used, Communication system, Teaching materials. The technological dimension integrates the technological infrastructure, digital materials, technological knowledge of users, type of communication, ICT integration and distribution of materials". (Bournissen, 2017, p. 58)

According to the authors, the three-dimensional model of the University of the Balearic Islands presents a complete set of elements that represent the majority of the activities carried out in an institution. Therefore, it represents an excellent guide for those institutions that are looking for a virtual pedagogical model to implement.

The model of González and Inciarte

The theories that theoretically support this model are constructivism and cognitivism, since they take into account the individual as an entity that assimilates, accumulates and refines previous knowledge, building new knowledge. Likewise, Piaget's theory constitutes a systematic approach, since it coincides in showing the elements and mechanisms by which the system performs its own regulation and maintenance.

This model is made up of four stages, starting from the design of the courses to the stage that involves the assembly, implementation, validation and evaluation of the model by experts, dependencies and students. For Diaz (2011)

"The constructivist theory bases this model, given its principles of interactivity, such as: the student acquires or elaborates his knowledge by himself; they are not passive recipients of knowledge; and the learning of the topics is based on

previous knowledge. The student tries to relate the new information with what he has previously acquired". (Díaz, 2011, pp. 107 - 108)

The model of the Technological Institute of Higher Studies of Monterrey

This model is focused on the student, who plays an active role in their training process. Three ways are identified as the student can achieve their learning, and towards which the activities, methodologies and didactics should point, these ways are: Self-directed Learning, Collaborative Learning, Significant Learning.

For the execution of the model it is carried out fundamentally by the teachers and a support team that dominates ICT. Gutiérrez (2004), emphasizes that *"the final result must provide elements that guarantee in the student one of the three learnings mentioned, for which it requires a pedagogical reflection on the design, activities and didactic strategies proposed for the achievement of the objectives. objectives".* (Gutierrez, 2004, p. 41)

The pedagogical model of the student adjusted to the Web

This model, according to Boeira (2001), takes the form of learning as the profile of the student, performs a constant accompaniment of it. To support the model, an evaluation system is also defined which is based on a history of the Web pages visited and another evaluation of the topics, this model has different tools to enrich the profile such as the change of teaching strategy with the link (link) called "noentendí", also has help, tips, calculator, among others.

The importance of this student model is expressed by Boeira (2001), when he states

"traditional student models are harshly criticized since their modeling is barely efficient in limited domains, since the student model is based on predefined hypotheses that revolve around rules that are also predefined. This means that this dependency on the domain cannot describe or predict the entire variety of human behavior" (Boeira 2001, p. 201).

This proposal proposes a student model based on the student's level of knowledge about the concepts, topics and subjects, special emphasis is placed on the diagnosis of the level of understanding, which is carried out through computerized adaptive tests, evaluating not only the answer if not the way it is answered.

The technological humanistic pedagogical model

This model is based on Technological Humanism, it is oriented towards the achievement of professional growth in relation to the permanent appropriation of knowledge, abilities and skills by the actors through the development of autonomous learning through which decision-making on the learning is done by the student. It concentrates didactic and pedagogical strategies such as: autonomous, cooperative and collaborative learning, and learning oriented to the development of creativity.

In this context, Sierra (2006), refers that

“the technological humanistic pedagogical model establishes the set of relationships that occur in the virtual classroom scenario, the teaching-learning process is oriented towards the achievement of professional growth in relation to the appropriation of knowledge, abilities and skills by the actors through the development of autonomous learning through which decision-making about learning is made by the student. It basically responds to the training needs to: appropriate knowledge, skills and abilities to perform optimally in virtual learning environments, communicate and interact in training contexts generated by the advancement of Information and Communication Technologies and interact with actors in the teaching-learning process in the context of cutting-edge technologies”. (Sierra, 2006 p. 3)

The three-dimensional model.

In this model, the dimensions of space, time and virtuality are related, combining different values of each variable, to obtain different modalities of distance education, through the conjugation of the virtual and the non-virtual, all in different situations of space and weather.

Of this model, Torres (2010) reviews that

“it offers better possibilities of maximizing Internet and communication resources through the Web, this functionality and efficiency through the Web was defined in terms of maximizing resources based on the following terms: The possibility of self-control of one's own learning, the adequate use of what is called Computer-Mediated Communication (CMC), the unlimited possibilities of interaction and feedback, the interactivity offered by hypertext as one of the main elements for maximization of resources”. (Torres, 2010, p. 4)

The combination of the different values of the three-dimensional model, eight types of educational modalities were obtained, establishing that each of the modalities was within virtuality and the maximization of Internet and communication resources through the Web.

The behavioral pedagogical model

This model pays attention to the way of acquiring knowledge and the conditions of learning, the student is not passive, he learns by doing, he makes use of specific objectives of the instruction which express what the student must achieve and that can be verified; In this model, the qualification becomes important as an element of approval or not, and as a stimulus or feedback for learning. The materials that are used for self-study tend to follow these guidelines since they define objectives, establish content and are designed around these, the evaluations, in addition, he considers that the machines could maintain the interest of the students because they provide regular reinforcement and always presents new material. However, Philip and Garcia, (2013) consider that *“technological devices and their mediation are not enough to capture the interest of students and their introduction must be cautious”*. (Philip and Garcia, 2013, pp. 300 - 319)

The social-cognitive pedagogical model

The main objective of this model is the full development of the individual for social or collective production. Group work fosters criticism, originates commitment in solving community problems, contemplates dialogue of knowledge, evaluation in the form of self-assessment and co-assessment is part of the learning process.

It is necessary to make a brief reference, the main exponent of the social-cognitive pedagogical model is Paolo Freire, in this sense Forero, LM; Cabrera, L.M.; Ordóñez, A. and Barragán, M. (2015) state that cognitivism “establishes that the process of construction of meaning is the central element of the teaching-learning process, given that the student learns any content when he is able to attribute a meaning to it. meaning, that is, it gives it meaning based on the conceptual structure that it already has, for significant learning to occur it is necessary that the information presented is structured, that the contents are related to what the student already knows and that learning make sense to the student. (Forero, LM; Cabrera, LM; Ordóñez, A. and Barragán, M. 2015 p. 12)

Taking into account all the previously analyzed models, important to have a global vision of how pedagogical models are currently outlined in virtuality, it is also necessary to highlight another circumstance that is considered important in our study and that runs parallel to any other section. to be considered on the integration of ICT in Higher Education. It is an aspect prior to the design of any virtual pedagogical model and it is about the study of the technological competences of the students, the detection of possible deficiencies for the intervention in the designed model and the proposals of a possible improvement in these circumstances is essential to be able to successfully complete the entire teaching-learning process.

In the opinion of the authors, the success of a virtual pedagogical model must be based on the principles of active learning, collaborative learning, autonomous learning, varied options of interactivity, synchronous and asynchronous communication, relevant and creative activities or tasks, continuous evaluation and technological competences. .

To conclude, it would be convenient to glimpse what the technological contributions hold for virtual education, since they are precisely the ones that generate or will generate new pedagogical models in the short, medium and long term, of which Artificial Intelligence can be mentioned, tools that has evolved over time in conjunction with Machine Learning, could achieve more personalized training, since it is based on behavior patterns, Micro-Learning, consisting of a way to assimilate content quickly, easily and concisely, allowing to take advantage of the available time and learn at the user's pace, the Video-Learning that allows creating and transmitting quality content in a fast and interesting way, offering the possibility of repeating the content according to the learning need, Virtual Reality that can provide a better practical experience, providing a space to experiment and put knowledge into action.

It has been possible to identify the importance of pedagogical models in virtual education and more especially its constituent elements and the aspects that represent the objectives, the goals and those aspects that influence the educational process, in order to try to maximize the use of learning in Virtual University Education.

CONCLUSIONS

Information and communication technologies offer a diversity of media and resources to support teaching; however, the available technology is not the factor that should determine the models, procedures, or teaching strategies. The creation of virtual learning environments must be inspired by the best theories of educational psychology and pedagogy. In this sense, it is necessary to clearly establish the pedagogical model that frames this new learning modality. With the presentation of these examples of pedagogical models for virtual education, it can be inferred that the proposals of said models are not only constituted by technological aspects. There must be deep epistemological, pedagogical, systemic and technological reflection,

The development and evolution of models, approaches, and systems have invigorated the way of thinking about education in virtuality. Student-centered approaches have evolved to those focused on learning, which do not exclude the figure of the individual, but legitimize it in the way in which the person can build their own routes, methodologies and their own strategies to build knowledge.

It is important to note that thanks to the potential of ICT and in particular to virtual learning environments, virtual education is developed, overcoming one of the obstacles that, historically, had prevented it from manifesting itself strongly as a valid and efficient educational system, with the possibility of multidirectional interaction between participants and managers.

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