

# INTERSEDES

REVISTA ELECTRÓNICA DE LAS SEDES REGIONALES DE  
LA UNIVERSIDAD DE COSTA RICA



Cortés Amarillo. Oleo de Norma Varela

---

**Evaluation of ten courses from the major in Pharmacy  
based on a curricular perspective**

*María del Carmen Acuña Rodríguez Victoria González García*

**WWW.INTERSEDES.UCR.AC.CR**  
**Vol. XIII, N°25 (2012)**  
**ISSN 2215-2458**

**Consejo Editorial Revista InterSedes**  
**Director de la Revista:**  
**Dr. Edgar Solano Muñoz. Sede de Guanacaste**

**Consejo Editorial:**  
**M.Sc. Jorge Bartels Villanueva. Sede del Pacífico**  
**M.Sc. Oriester Abarca. Sede del Pacífico**  
**Dr. Alex Murillo. Sede Atlántico**  
**Dra. Marva Spence. Sede Atlántico**  
**M.L. Mainor González Calvo. Sede Guanacaste**  
**Ing. Ivonne Lepe Jorquera. MBA. Sede Limón**  
**Dra. Ligia Carvajal. Sede Limón**

**Editor Técnico:**  
**Bach. David Alonso Chavarría Gutiérrez. Sede Guanacaste**  
**Asistente:**  
**Guadalupe Ajum. Sede Guanacaste**

**Consejo Científico Internacional**  
**Dr. Raúl Fornet-Betancourt. Universidad de Bremen, Alemania.**  
**Dra. Pilar J. García Saura. Universidad de Murcia.**  
**Dr. Werner Mackenbach. Universidad de Potsdam, Alemania. Universidad de**  
**Costa Rica.**  
**Dra. Gabriela Marín Raventós. Universidad de Costa Rica.**  
**Dr. Mario A. Nájera. Universidad de Guadalajara, México.**  
**Dr. Xulio Pardelles De Blas. Universidad de Vigo, España.**  
**M.Sc. Juan Manuel Villasuso. Universidad de Costa Rica.**

**Indexación: Latindex / Redalyc**  
**Licencia de Creative Commons**

**Revista Electrónica de las Sedes Regionales de la Universidad de Costa Rica,**  
**todos los derechos reservados.**  
**Intersedes por [intersedes.ucr.ac.cr](http://intersedes.ucr.ac.cr) está bajo una licencia de Creative Commons**  
**Reconocimiento-NoComercial-SinObraDerivada 3.0 Costa Rica License.**



## **Evaluation of ten courses from the major in Pharmacy based on a curricular perspective**

Evaluación de diez cursos de la carrera de Farmacia desde una perspectiva curricular

*María del Carmen Acuña Rodríguez*<sup>1</sup>  
*Victoria González García*<sup>2</sup>

**Recibido: 5 de mayo 2012**

**Aprobado: 28 de junio 2012**

### **Resumen**

El tema de la calidad de los cursos preocupa a muchos y muchas docentes de la Universidad de Costa Rica. La toma de decisiones para mejorar los cursos que se imparten requiere de información que se obtiene a partir de estudiantes y docentes, así como de los resultados de rendimiento académico. El presente esfuerzo recoge los resultados de la evaluación de diez cursos de la Licenciatura en Farmacia de la Universidad de Costa Rica. Entre sus resultados, se encuentra que no existe relación entre el perfil profesional que desea formarse y las actividades didácticas que prevalecen en estos cursos. En otras palabras la evaluación refleja que debe hacerse ajustes en los cursos para poner en práctica premisas pedagógicas como pensamiento crítico y creativo, toma de decisiones y solución de problemas.

### **Palabras clave**

Evaluación de cursos – Práctica Docente – Educación Superior

### **Abstract**

Quality of courses is an interesting subject for many professors at the Faculties or Schools of the University of Costa Rica. The decision to improve courses requires information from students and professors as well as information from academic performance results. The present article gathers the results of the evaluation of ten courses from the major in Pharmacy of the University of Costa Rica. Results reflect that there is no relationship between the professional profile of the major and the didactic activities used in the evaluated courses. In other words, this evaluation reflects that changes must be done in the courses in order to put into practice pedagogical-oriented ideas, such as critical and creative thinking, decision making, problem research, and problem solution.

### **Key Words**

Courses evaluation – Teaching practice – Superior Education

---

<sup>1</sup> María del Carmen Acuña Rodríguez: Psicóloga. Licenciada en Psicología, Universidad de Costa Rica. Docente-investigadora en el Centro de Evaluación Académica. Como parte de sus funciones, asesora procesos de revisión curricular, evaluación e innovación docente; también realiza investigación en temas de educación superior. Correo electrónico: mariadelcarmen.acuna@ucr.ac.cr

<sup>2</sup> La profesora González es Educadora y cuenta con Maestría en Psicopedagogía. Labora como asesora – investigadora en diseño curricular y evaluación académica en el Centro de Evaluación Académica de la Universidad de Costa Rica. Asimismo, coordina el TCU Comer Orgánico de la Escuela de Sociología. Correo: victoria.gonzalez@ucr.ac.cr

## **1. Introduction**

At the beginning of the last decade, the Faculty of Pharmacy of the University of Costa Rica made its first exercise of self-assessment for the degree program, with the purpose of attaining accreditation. Once accredited by the National System of Accreditation of the Higher Education (SINAES, for its acronym in Spanish), under the coordination of the Curriculum Commission, they developed an Improvement Plan or “Commitment to Improve.”

Four years later, they obtained the reaccreditation and, as a result of it, they are currently developing this improvement plan. For some years now, the Faculty has developed an initiative of curricular improvement looking forward to responding to the requirements that the actual changing context demands, as well as to apply the recommendations cropped from the process of self-assessment and reaccreditation of the degree program.

The Curriculum Commission (CC) was analyzing the implementation of the necessary improvements that the re-accreditation inform involved. Based on the results of accreditation, and reviewing the possibilities to implement the "Improvement Plan"<sup>3</sup>, it was noticed that some courses have a consistently low pass rate of students, while others have a consistently high pass rate, which was an interesting phenomenon to evaluate because it allows to deeply assess those factors that were negatively affecting the academic performance of students. In this process, the Faculty requested the support and participation of the Academic Evaluation Center (CEA, for its abbreviation in Spanish), specifically from the Department of Academic Research and Evaluation (DIEA, for its abbreviation in Spanish) in order to develop an evaluative research of those courses. It is necessary to clarify that the evaluation was not part of the reaccreditation process, even though to trigger situation came from it; it was made as part of the assessment consultancy services that this Department offers.

In such context, ten courses were evaluated with the purpose of recognizing the curricular factors that are present in the Faculties' educational activities<sup>4</sup>. Thus, by having a multidimensional look, it would be easier to identify which strengths and aspects to improve while also taking as base the professional profile of the degree program. Therefore, this research consisted on evaluating ten courses from the major in Pharmacy of the University of Costa Rica, based on a curricular perspective. It was designed as a qualitative exploratory study, with three categories of analysis: the Faculty's Project, the Human Interactions, and the Emergents.

In this paper, researchers start from the concept that a curricular proposal cannot be reduced to the dynamics among the teacher and the students in the classroom, neither to the revision of “the components” of the major's curriculum, nor the courses' syllabus. The intention is to transcend the “analysis of the parts” in

---

<sup>3</sup> Understood as the document that the Faculty presents to SINAES, detailing the actions they will follow to overcome the weaknesses detected during the self-assessment process, and including the results of the external evaluation (SINAES, 2010).

<sup>4</sup> We understand ‘educational activities’ as the ones developed in theoretical courses, laboratories, and practical courses.

order to look at all of those parts and try to understand the relations between them with the intention of understanding the pedagogic dynamic of this Faculty.

This research was an opportunity to promote reflection processes inside the Faculty as a part of their process of self-evaluation and continuous improvement, whose results will be useful for the Curriculum Commission to generate spaces of ‘formative interaction’<sup>5</sup> to promote improvements in the pedagogic experiences and, hence, to impact positively the Faculty’s plan of improvement. The purpose of this article is to present the conceptual framework and the methodological approach that were built for this study. The results will not be presented in order to maintain the Faculty’s confidentiality.

## **2. Conceptual framework**

To understand the curricular dynamic around the organization of the degree program’s different axis, the researchers created three categories of analysis that guided the interpretation of the reality found. In the following section, the conceptual proposal, which was built by the authors, will be explained.

### **2.1. The faculty’s project**

#### **Epistemological Position**

The word epistemology has a Greek root (‘epistémē’, meaning intelligence, knowledge) and makes reference to an “*organized and grounded knowledge that someone has been able to learn, and in which that person fulfills*” (Altisen, 2009, p. 2), establishing a relation between knowledge and experience. That is to say, the epistemology leads to the following questions: which is the true knowledge? How to describe the process of constructing truths and knowledges? In the processes of knowledge construction, it must be spoken about teaching or about learning?

Another interesting interpretation from Altisen (2009) about epistemological positions is the duality that he proposes: from one hand, a general epistemology that asks: how is possible for us to know? On the other hand, a particular epistemology that asks: why should people believe in what scientists declare? In other words, do people approach knowledge “generally true” or knowledge scientific in particular? (Altisen, 2009)

In addition, thought takes part in the processes of knowledge construction. It is the one who guides each person in his or hers decision about who to believe, which truth to assume, which knowledge to adopt, which

---

<sup>5</sup> This concept refers to “*the space of exchange of ideas, emotions, thoughts, intuitions, arguments, and opinions*”, through which knowledge is built (González, 2008, p. 23). Likewise, the author proposes that the spaces of ‘formative interaction’ are characterized for being horizontal, respectful, interesting, and defiant.

criteria to choose to confirm or to deny truths. As posed by Altisen (2009, p.12) “thinking is to judge” from an “objective way” (p. 15). Lipman (1998, p. 63) names this kind of thought as “higher-order thinking”, which “*is not exclusively equivalent to critical thinking, but a merge of critical thinking and creative thinking.*” In such sense, Lipman (1998) quoting Michaelis mentions four types of thought: “*critical thinking, creative thinking, decisions making, and problem solution and investigation*” (p. 85). These types of thought interact with base knowledge (which can be called ‘information’) that has been generated from other thought abilities, such as memory, interpretation, comparison, data collection, and classification. It needs to be clarified that information is not necessarily generated nor obtained before thought. As a matter of fact, it is possible that both processes occur simultaneously and interactively; that means if a person finds information, he or she thinks; and if a person thinks, he or she looks for information.

With the intention of knowing the Faculty’s epistemological position, the researchers asked the participants to describe general characteristics of the professionals that are being formed with the curricular plan. With this information, the researchers identified three factors that are needed to accomplish the formative project of the Faculty: to think critically and creatively, to make decisions, and to solve and investigate problems. The reason is that the graduate profile proposes to form professionals that are leaders in their field, propositive, and with the ability to solve the challenges that society poses. Those three factors are explained as follows.

#### *Critical and creative thinking*

In this paper, the authors conceptualize “critical and creative thinking” as the opportunities that teachers, in the educational centers, offer to the students for listening, analyzing, understanding, making questions, and proposing their own ideas about the information received from the context.

#### *Decision Making*

The decision-making process is seen as the selection and choice of opportunities that the students have to make, regarding the different problems they face in their courses during professional education; for example, to select their interesting themes, to choice problems to solve or experiments to do, to select an individual or group work, to propose evaluation strategies.

#### *Solving and Investigating Problems*

“To solve and investigate problems” refer to the opportunities that students have to choose and engage a problem in their field, to investigate and solve it, both in an individual or group way, and in contact with a social community, a research institute or laboratory.

*Contents and curricular plan*

To analyze the contents of any curricular plan is necessary to recognize two aspects in the Schools and Faculties of the University of Costa Rica: the curricular design model and the pedagogical approach. In such manner, curricular designs and the conceptions about contents in them are not neutral. They respond to a specific approach. Escudero (1999) proposes the existence of three different approaches in which curricular designs can be understood: Technician and Expert, Deliberative and Practical, and Critical. The researches adapted Escudero's contributions on the table below, in order to guide the results' analysis and interpretation.

**Table Nº 1. Curricular Design Models and implications in the professional education.**

	<b>TECHNICIAN and EXPERT</b>	<b>DELIBERATIVE and PRACTICAL</b>	<b>CRITICAL<sup>6</sup></b>
<b>ORIGINS</b>	<p>First moment: rationalization (Tyler, 1973).</p> <p>Second moment: method's technical improvement (Mager, 1972, Bloom and others, 1975).</p> <p>Third moment: method's theoretical improvement (Gagné y Briggs, 1976)</p> <p>Fourth moment: systemic-cybernetic conception (Romiszowski, 1981).</p>	<p>When the technician and expert model tried to be implemented in educational centers, practical models were born (J. Schwab, 1969) inspired in the philosophical and pedagogical pragmatism of Dewey, as well as with the contributions of Piaget and Kohlberg</p>	<p>Facing the technical proposes, also arise the critical orientation, due to the importance that self-criticism has for many authors as a way to make awareness for the social transformation, as well as in front of unfair social and educative structures (Martínez Bonafé, Freire, Vygotsky).</p>
<b>PREMISES</b>	<p>The knowledge is:</p> <ul style="list-style-type: none"> <li>- universal and not contextual;</li> <li>- objective and neutral;</li> <li>- techniques are the solution (recipe);</li> <li>- control and efficacy are the interest.</li> </ul> <p>There is a management and administrative conception of education. Learning is sequential and accumulative.</p>	<p>The curricular problems are:</p> <ul style="list-style-type: none"> <li>- practical, but not theoretical</li> <li>- solved through experience</li> <li>- can be solved through deliberation.</li> </ul> <p>The curricular design is conceived as a process of educational research.</p>	<ul style="list-style-type: none"> <li>-The focus is in the process instead of the product.</li> <li>- It recognizes cultural diversity, including each cultural manifestation.</li> <li>- Educational phenomena are socially constructed realities, which respond to specific ideologies.</li> <li>-Knowledge construction occurs from participation and communication.</li> <li>- Educational culture is important for learning.</li> </ul>
<b>CHARACTERISTICS</b>	<p>It identifies and formulates the elements of the curriculum (objectives, method, and evaluation).</p> <p>Analyzes the student, the society, the knowledge, the philosophy and the psychology.</p> <p>It is a rational and ordinate sequence.</p> <p>The objectives and profits control are operative, precise and rigorously formulated.</p>	<p>The emphasis is in the process, above the products.</p> <p>Continuity and interaction with previous experiences are the principal premise in the learning construction.</p> <p>Processes of action and reflection must be used in learning experiences.</p> <p>Knowledge areas appear in the investigation process.</p>	<p>It is generated an environment were speech emerges and is shared in learning communities, above objectives and goals.</p> <p>Knowledges are built from social interaction and contextual needs, with a social justice engaged ethics.</p>

<sup>6</sup> The author names it "critical and postmodern"; nevertheless, these two concepts are not necessarily together. A critical approach is not necessarily postmodern, and a postmodern approach is not necessarily critical.



**Table Nº 1. Curricular Design Models and implications in the professional education.**

	<b>TECHNICIAN and EXPERT</b>	<b>DELIBERATIVE and PRACTICAL</b>	<b>CRITICAL<sup>6</sup></b>
	The learning interest is to capitalize information in an ordinate sequence.		
<b>SYNTHESIS</b>	The education of human beings is concentrated on the product to obtain rigorous formulations (learning objectives) and on quality of this product. (...) Arguments based on scientific knowledge are overrated, and other kinds of knowledge are despised, such as reflection, valuation and critical thinking.	“Curriculum is conceived as a continuous process of deliberation, as transactions among persons which are morally engaged with the scholar institution. So, the curricular design should be seen as a processual, situational, cyclic and evolutionary process; its dynamic is deliberation and consensus.”	This critical model makes possible that students became conscious of their own learning and social situation, in order to transform it, looking forward for a more fair and equitative society. School promotes and allows decisions making, participation, commitment, and the practice of democratic values.

Source: Authors' elaboration, based on Escudero's contribution (1999).

To determine which is the best curricular design approach for a School or Faculty allows to know it and to compare it with its pedagogical vision. In other words, knowing the pedagogical strategies related with contents teaching to educate professionals helps to discover if there is coherence between the Faculty's project and the pedagogical practices with which students are learning. To implement this idea, the researchers built Table 2, in which it is possible to relate each approach's vision about contents, curricular plan and kind of professional educated. By understanding these results, the obtained data will appear in one of those categories; so, there will be two facts:

1. To know the curricular tendency of the Faculty's project by means of knowing its content and curricular plan concepts.
2. To have useful data to improve pedagogical strategies in order to answer to curricular weaknesses found in the assesment process.

**Table Nº 2. Contents concept in each design curricular model.**

	<b>TECHNICIAN and EXPERT</b>	<b>DELIBERATIVE and PRACTICAL</b>	<b>CRITICAL</b>
<b>CONTENTS</b>	<p>Science valid truths obtained with the scientific method, which analyzes parts to understand reality. These truths should be acquired to practice them in the professional exercise.</p> <p>In classrooms, contents are transmitted with memory pedagogical strategies, through book and journal readings.</p>	<p>Valid truths constructed during the academic and professional education, with an empirical way, through reasoning and problem solution exercises.</p> <p>In classrooms, contents are transmitted through pedagogical strategies such as practices, field work, laboratories, and boarding schools experiences (internships).</p>	<p>Valid truths constructed with information that is scientific, contextual, social, and a product of experience, used to solve a social situation in a sustainable and social fair way.</p> <p>In classrooms, research and interaction with the discipline's environment are promoted, to make students solve problems in a specific community.</p>
<b>CURRICULAR PLAN</b>	<p>Logical and linear sequence of contents that need to be transmitted thought from the simplest to the most complex.</p>	<p>Sequence of learning experiences structured in courses that are theoretical, practical, and with context interaction, in which students can put into practice knowledge obtained with a progressive and sequential way.</p>	<p>Sequence or group of learning experiences interconnected so that students can solve situations with pertinent information, which is congruent with previously defined principles and values.</p>
<b>CHARACTERISTICS OF THE FUTURE PROFESSIONAL</b>	<p>A human being orientated to the memorization, submission, and application of techniques, with few capacity to lead and to solve problems with his or hers own initiative.</p> <p>This person only believes in exact science's truths, transmitted by professors, books or journals.</p>	<p>A human being orientated to solve problems (in a pragmatic way) without analyzing a situation's causes, or why and how it needs to be changed.</p> <p>Values are not important, because the ones from the power structure prevail. Seeks decontextualized information, oriented to the practical solution of is problems, in a short term period.</p>	<p>A human being that gradually becomes conscious of actual context conditions, with sefl-concept that makes him or her easier to make decisions, have leadership and initiative, as well as to searcha and recognize relevant information.</p> <p>A professional who looks for time sustainable solutions, determinated by values like social justice.</p>

Source: Authors' elaboration.

The above mentioned approaches are summarized as follows.

#### *Technician and Expert*

This model values the students' capacity to repeat and use knowledge received from their professors during the semester, where contents are important only if they are based in positivist scientific research results and they will be used after students' graduation. In these cases, the pedagogical technique is to memorize information from books, journals and professor's expositions.

#### *Deliberative and Practical*

In this model, contents are seen as exchanges between students and professors, engaged with their learning process. Learning is understood as a process based both in positivist scientific research results, as in interpretative knowledge, where prevails reasoning and problem solving exercises, using pedagogical techniques such as field work, practices, laboratories, and boarding schools (internships).

#### *Critical*

In this model, contents are seen as an opportunity to know the social, academic, scientific, and interpretative context with the objective to transform this context in order to reach an egalitarian society. In such sense, professors in classrooms promote decisions making, participation commitment, interaction and investigation with the disciplinary environment, in order to make students solve problems of a particular community.

#### Learning strategies

*"The central purpose of educative intervention is that students become success learners, as well as critical thinkers and active managers of their own learning process."*  
Frida Díaz Barriga and Gerardo Hernández<sup>7</sup>

In this paper, the authors follow the perspective of "learning" and distinguish it from the concept of 'teaching', due to our epistemological position that will be explained below.

Teaching has been understood as the transmission of contents, information or knowledge, made in a vertical way from professors to students, because professors have the knowledge while students receive it, like depositaries. In this traditional way of teaching, the dynamic is characterized by relationships of power-weakness and knowledge-ignorance; nevertheless, "*students –people who*

---

<sup>7</sup> Díaz Barriga, F. & Hernández, G. (1998). *Estrategias docentes para un aprendizaje significativo, una interpretación constructivista*. (3°. Ed.). México: McGraw-Hill/Interamericana Editores. Page 3.

*are each day more clear about their right to think and participate in all the decisions that affect them– does not want to stand it anymore.*” (González, 2008, paragraph 5).

Learning, instead, is the knowledge construction process that students develop, which is mediated by professors through horizontal relationships where both parts (students and professors) are teaching and learning at same time. Therefore, they are forming themselves professionally while developing a sense of working, personal, and social life. So, following the proposal of Frida Díaz Barriga and Gerardo Hernández (1998), the professor’s role is to organize and mediate the encounter between students and knowledge. However, this process is developed in an individual way, but it implicates also social activity and sharing of experiences: *“the student can’t construct the knowledge alone, but due to others’ mediation in a particular time and cultural context”* (Díaz Barriga and Hernández, 1998, p. 1). It’s important to say that in the context of higher education, those “others” are the professor and the classmates. In such sense, interaction between students and professor is a participative and integrated process, in which a directive model is put away because it hinds flexibility. In this way, the professor should transform rigid instructions in order to adjust the pedagogical process to the students and groupal needs.

Learning strategies are, in one way, all the actions that students develop in order to learn. On the other way, they are all the activities that professors do with the intention of making each student construct his o her own knowledge. In this way, it is important to say that:

the teaching “method” that a professor must follow cannot be prescribed from outside; there is not only one way to promote learning, and it is necessary that the professor decides what is convenient in each case, through a reflection process about the context and the group’s characteristics. (Díaz Barriga and Hernández, 1998, p. 4.)

In addition to masterly lectures<sup>8</sup>, different strategies can be implemented. In professions that have a practical nature, curricular plans should assign at least a third part of their credits to activities where students have contact with situations that resemble the ones they will later face in their professional life. For example, the use of informational and communicational technologies like virtual platforms, digital videos, or web sites; also, practical exercises or laboratories where students propose problems, investigate and solve them. Another idea is to organize study trips or professional practices in different organizations. In brief, theory should join practice to have successful learning and a successful professional education.

---

<sup>8</sup> “Masterly lectures” are understood as the pedagogical strategy in which professor transmits knowledge and students receive, assimilate and memorize it.

Moreover, it must be remembered that higher education goes beyond teaching for professional majors, because -as its name indicates- it addresses the integral education of people, of ethical citizens who enclose their professional practice with social responsibility. For that reason, learning process must have transversal axis, such as: research, environmental care, gender perspective, and sensibility toward other people; however, those aspects need to be improved everywhere in the university.

Regarding administrative aspects, groups with many students are counterproductive for successful learning. The ideal quantity is to have 30 students maximum, because it makes giving better attention and monitoring each student possible.

#### Evaluation of learnings

*« In the educating context, evaluation must be understood as a learning critical activity, because it is assumed that evaluation is learning since we acquire knowledge with it. »*  
Juan Manuel Álvarez Méndez<sup>9</sup>

Evaluation is a part of learning that allows knowing the advance students are making regarding knowledge. Furthermore, it starts from the previously built knowledges of the discipline itself because it seeks to reinforce them and turn them into a new possibility to construct knowledge. Santamaría Vizcaíno (2005, p.13) explains this when he states that: *“Only when we assure learning, we could assure evaluation, good evaluation that educates turns itself into a way to learn and a expression of knowledge.”*

To make evaluation a real part of the construction process of knowledge, it is necessary to pose some questions before starting an evaluation: Why do professors evaluate? What is evaluated and what is not? When are the best moments to evaluate? Who designs the evaluation? Therefore, the evaluational process is not neutral. In it, people (professors and students) not only learn individually and are influenced by many personal and contextual factors, but also the process has learning implications, as it is shown in the next chart:

---

<sup>9</sup> Álvarez Méndez, J. M. (2005). *Evaluar para conocer, examinar para excluir*. (2º. Ed.). España: Ediciones Morata. Pág. 12.

<b>Table Nº 3. Learnings produced in an evaluation process</b>	
<b>Professors learn in order to...</b>	<b>Students learn from...</b>
Know	The evaluation itself
Improve their practices as teachers	The correction of mistaken ideas
Collaborate with their students' learning	The comparison of information that teachers offer

Source: Authors' elaboration.

As Álvarez Méndez (2005) states, evaluation serves to learn as long as it becomes a knowledge activity and a sensitive learning act to apply in real situations, making this possible in the moment of "correction". In the present study, authors understand "correction" as self-knowledge about learned contents, contents which are still not clear, and contents that are not found useful. However, when professors give their students the corrected evaluations, they must make sure that correction is always *"critical and argued, but never disqualifying nor penalizing"* (Álvarez Méndez, 2005, p. 12). This means that is necessary to review with students the issues that generate doubts and the ones that are unknown for them.

Evaluation is an excellent opportunity for learners to put their knowledge in practice, and feel the need to uphold their own ideas, arguments and knowledge. It should be the moment in which, besides the acquisitions, also doubts, insecurities, and ignorances arise if there is a real intention to improve them. (Álvarez Méndez, 2005, page 13).

On the other hand, according to the proposition of Santamaría Vizcaíno (2005), evaluation of learnings could be characterized by the following:

<b>Table Nº 4. Characteristics of evaluation</b>	
<b>Characteristic...</b>	<b>Because...</b>
Indispensable	It is part of professional and personal life.
Dynamic	It is a permanent, active, and flexible process.
Referential	It is related to other processes, and it is a starting point to make necessary changes.
Complex	There are many elements involved with it, which requires creativity, effort, and professional work.
Multifaceted	It can take many forms, and this allows to evidence diverse aspects of the same process.
Dialogic	It is established among two (or more) parts: professors and students.
Contextual	As well as the learning process, evaluation develops in a specific context.

Source: Authors' adaptation from Santamaría Vizcaíno (2005, p. 12-13).

### *Evaluation and learning strategies*

School failure is generally evidenced by deficient results or evaluation “failure” and, frequently, this result is attributed to student performance. However, to analyze causes of this phenomenon involves looking at different factors that are present in educational process which have pedagogic, institutional, economic, historic, and sociocultural origins. An important fact to consider when evaluating, mentioned by Diaz Barriga and Hernandez (1998), is to determine in which stage of learning is the majority of students, so the professor can develop apt evaluations; on the contrary, constructed knowledge would hardly be reflected in an appropriate way or as desired by the instructor.

Evaluation is strongly related to strategies used by professors so that their students build knowledge; therefore, being coherent with these strategies entails an avoidance of contradictions between the kind of evaluation used and the strategies professors put into practice. Professors can achieve such coherence through the permanent study of techniques and instruments used to evaluate students’ learnings, as well as through the discussion, innovation, and experimentation with their colleagues.

According to Brown and Glasner (2003), some examples of evaluation methods are: “*reports, memos, exhibitions, learning materials, creative productions, bibliographies, critics, journal papers, evaluated seminars, and multiple-choice questions*” (p. 29). To evaluate practice, some examples are: competence lists, projects, case studies, notebooks, diaries, reflexives diaries, critical incidents, and portfolios (Brown & Glasner, 2003, p. 118-120). Regarding examinations, they recommend to use alternative forms, such as short-answer questions, case studies, simulations, research exercises, clinical tests with structured objectives, and open-book exams. (Brown & Glasner, 2003, p. 30).

## **2.2. Human interactions**

Human interaction is the most determining factor for learning; there is extensive research that proves it. The human being is social by nature, and this sociability is practiced through communication that is accomplished by superior order skills, such as expressive language in all of its forms, especially in oral and written word. Reading and writing abilities (literacy) allow the human being to interact with knowledge that was built by others; it does not matter if they are dead or alive. This contributes to evolution, because knowledge discovered by others makes personal knowledge richer and promotes new knowledge production.

Vygotsky said the human being is characterized by a *primary sociability*. In Vygotsky's time, this idea was only a postulate, a theoretic hypothesis. However, in present time, the thesis of primary sociability, which is in part determined genetically, has almost a scientific status established as result of the convergence of two research tendencies. In one way, biological research, such as the one regarding the role sociability has in anthropogenesis or the one regarding morphofunctional development of nursing children. For instance, new research regarding brain zones that control social functions continues to appear. For example, human face or voice perception experiment an early and accelerated maturation. Also, empirical research about social development in early childhood widely shows the thesis of a primary and early sociability (Ivic, 1994, par. 14). Due to the quantity of research that this thesis shows, it is possible to affirm that human interactions determine people's significant learning through the sharing of knowledge. In higher education, this idea has curricular and pedagogical implications, like the concept of "zone of proximal development" proposed by Vygotsky, that becomes important since it

has, in first place, a theoretical scope. In the socio-cultural conception of development, we cannot consider a person as a being isolated from its socio-cultural environment. ... Bonds with other people are part of its own nature. In such way, human development cannot be analyzed nor its aptitudes or education diagnosed if social bonds are not considered. The concept of zone of proximal development illustrates exactly this point of view (Ivic, 1994, par. 68).

Because of that, this zone can be defined as the space between those knowledges that can be built without help and those who need another person's mediation either a classmate, friend, professor, or tutor; that is, another human being with whom a formative interaction is developed. In such sense, Carmen Elboj et al. (2006) propose that human interactions can be placed in three dimensions:

- \* Objectivist, in which knowledge is received from the one who knows, this is, the professor. In this case, the student is a neutral human being that only interacts with others to obtain the content that she or he has to memorize.
- \* Constructivist, in which knowledge is built to understand reality, based on students' previous knowledge.
- \* Dialogic, it means that knowledge is built through a dialogue among previous knowledge, contextual conditions, and social problems or challenges while being inside a process mediated by the professor. It considers objectivist and constructivist interactions, and transcends them to form a reciprocal knowledge construction relationship.

In the present study, pleasant human interactions are defined as dynamics that people want to experience and that promote knowledge deepening, both in an academic context as in a social context. Such dynamics generate wishes to attend class and also to pose questions and problems to



professors or classmates. Therefore, to form professionals who can respond to social challenges with creativity and scientific rigor, dialogic and pleasant interactions should prevail among all the people that daily participate in educational dynamics, with the objective of promoting significant learning and commitment with the profession.

For this reason, the researchers observed relationships between students-students, professor-students, and professors-professors. It is important for a professor to know what kind of relationships prevail in the School or Faculty where he or she belongs; and also to have spaces for reflection and construction of innovating learning proposals that try to transform human interactions when it is necessary.

### **2.3. Emergent facts**

Considering that the research was made in a Latinamerican context, the authors took the definition from the Royal Spanish Academy where the word “emergent” has been defined from its Latin origin and means, among others, “something that is born, comes out and begins from another thing”. (Real Academia Española, 2009). Other authors define it as:

the qualitative totality of changes that are spontaneously generated by a system. This behavior's properties are caused by the interactions among all the different parts of the system; that is to say, they cannot be reduced to individual components. An emergent behavior is more than the sum of its parts. (Art and Industrial Creation Center, 2007, paragraph 1).

In the same way, Margery (2010, p. 32) explains that *“an emergent is a characteristic, function, or action that emerges when all parts are related, but does not emerge when such parts are isolated.”* Also, he clarifies that the emergents are *“the attributes that a system exhibits, which are not found separately in any of its components”* (E. Margery, personal communication, September 10<sup>th</sup>, 2009). From all these ideas, it can be drawn that an emergent is something that appears as a result of the interaction among the parts of a phenomenon. Then, it is what must be done (or must appear) as long as it is a consequence or result of what has happened; in other words, it needs other elements and connections in order to arise.

In the context of education, for example, Margery (2009) proposes that *“the emergents’ Pedagogy implies to break the old idea of planning 100% of a class, it is to be prepared for working with whatever emerges, with uncertainty and imprecision”* (E. Margery, personal communication, September 10<sup>th</sup>, 2009). In a similar way, from a socio-cultural perspective, the concept is used to refer to a *“new knowledge that burst into our context”* (Art and Industrial Creation Center, 2007, paragraph 1).

In this research, the authors define as emergents those phenomena or factors that arise during field work with professors and students in a School or Faculty, which were neither foreseen nor catalogued as categories of analysis, but affect the pedagogical dynamic of the evaluated courses. What emerged in this study were situations that, in one or another way, either consciously or unconsciously, represent worries that professors and authorities have.

### **3. Methodological approach**

#### 3.1. Trigger situation

The Faculty of Pharmacy obtains the reaccreditation of its degree program and, as a consequence, seeks to improve the pedagogical processes of forming professionals to respond to social needs and demands.

#### 3.2. Purpose

The classrooms<sup>10</sup> are the spaces in which professionals are formed. Also, there is where the greatest educative contradictions can occur; that is, where everything that is written in the Faculty's curricular plan can be fulfilled or not. But also, it is where people, in an effort to put into practice the pedagogic intentions, get to experience the limitations and challenges that this duty involves for them. Because of that, to improve the educative practice in university courses involves starting from the experience and the knowledge that has been built concerning the 'critical factors'<sup>11</sup> that affect the teaching job, in which students and professors participate. Considering this, the purpose of this evaluation was to promote a process of comprehensive understanding about the functioning of ten courses of the degree program, in order to build curricular improvement criteria.

#### 3.3. Research approach

Research was developed under a qualitative approach, since data gathering was given without using numeric measurements (Hernández, Fernández y Baptista, 2003). Furthermore, hypotheses are not necessarily tested (Grinnell, 1997, quoted by Hernández et al, 2003). In qualitative studies, the purpose is to analyze reality as it is observed in a previously defined social systemtended goal.

---

<sup>10</sup> We consider 'classrooms' as the spaces where learning processes happen, which go further than the four walls of a conventional classroom at the University of Costa Rica. That is to say, this concept also takes into account other spaces, such as laboratories, study tours, research centers, and experiences in institutions and organizations.

<sup>11</sup> That is to say, those factors that limit the accomplishment of the Improvement Plan (Margery, 2009).

In this case, the intended goal was to understand the dynamic that exists among several curricular aspects of the appointed degree program.

#### 3.4. Type of study

According to the guidelines from Hernández, Fernández & Baptista (2003), an exploratory study is when “*a shortly studied research topic or problem, for which there are many doubts or has not been addressed before*” (p. 115) is examined. In line with this explanation, the present study is exploratory because it was carried out as a way to approach the context of the Faculty of Pharmacy from the University of Costa Rica, and particularly to 10 courses that the curricular plan offers.

#### 3.5. Research strategy

The strategy followed was non experimental and cross-sectional. It was non experimental because variables were not deliberately manipulated, nor any specific situation was prompted to be studied. The situations were solely observed and analyzed as a phenomenon as they are on their natural context. In that sense, “*already existing situations, not intencionally promoted by the researcher*” (Hernández et al., 2003, p. 267) were studied. Also, it was cross-sectional cut since the information was gathered in a particular period (Hernández et al., 2003). In other words, it was not executed as a study of systematic research over several years; a given situation was selected in an specific year (the year 2008).

At this point, it is important to clarify that, under the Faculty’s request, the evaluated courses met two criteria:

- A. Having consistently, in the period of study, a students’ pass rate equal or less than 70%
- B. Having consistently, in the period of study, a students’ pass rate equal or less than 90%

According to this, a total of 10 courses were chosen: 4 under the criteria A and 6 under the criteria B.

#### 3.6. Sources of information

With the objective of having breadth of information, the following persons and documents were consulted:

- ✓ The Faculty’s Dean
- ✓ The Curriculum Commission’s Coordinator
- ✓ Professors of the evaluated courses
- ✓ Professors of non evaluated courses
- ✓ Students, from second to fifth year
- ✓ Graduated students

- ✓ Syllabus of the evaluated courses
- ✓ Institucional and particular documents of the Faculty

### 3.7. Subjects

In the curriculum's implementation, the interaction among people is considered of great importance. In this case, the critical participation<sup>12</sup> of the people directly involved with the evaluated courses was essential, namely:

- ❖ The human teaching talents participating in the courses' dynamic, that is to say, professors, level coordinators, and the Curriculum Commission Coordinator.
- ❖ The human student talents, that is to say, people who were students of the courses during 2008, including those who passed the course the first time and those who had to repeat it.

Applying the above mentioned criteria, the following persons were interviewed according to their role in the educational and the course schedule.

➤ Dean of the Faculty and Curriculum Commission Coordinator

These two professionals were consulted because they know the faculty's mission and also, they are the responsible authorities for the implementation of the program's improvement plan. In addition, they know, in a general way, the learning strategies used in the Faculty.

➤ Professors of the evaluated courses

They were consulted because they are the people in charge of developing the courses. A total of 7 teachers were summoned for group interviews; twelve professors assisted to the first meeting and nine to the second.

➤ Professors of non evaluated courses

The researchers included the participation of teachers from other courses that were not the 10 evaluated, in order to make a comparison in terms of similarities and differences regarding the contributions given by the evaluated courses' professors. Seven persons were summoned and five participated in the group interview.

*Criteria for selecting the non evaluated courses:*

Before summoning the teachers, the researchers defined that for each semester, the quantity of professors of non evaluated courses must be proportional to the ones from the evaluated courses

---

<sup>12</sup> The critical participation implies that people can analyze the causes and consequences of the situation they are experiencing, as well as "the exercise of being able to have influence in the decision making to transform reality and contribute with the construction of their lives' and projects' development" (Salazar, de Souza, Chez & Torres, 2001, p. 62).

that were interviewed. Furthermore, it was necessary to establish some criteria in order to select the courses that were not evaluated. Then, the researchers setted the following:

- ✓ Being courses that belong exclusively to this degree.
- ✓ Have being given in 2008.
- ✓ Being in the same cycle (same semester) of the evaluated courses.

➤ Students

Considering that the student population is in whom the educational proposal is fulfilled through the curricular plan, it is essential to include them in the study. In the present case, it was determined that the sample will be constituted by 20 students per level starting on the second, and understanding ‘level’ as each year of the program. Therefore, the questionnaire will be applied to a total of 80 students. When the researchers applied the instrument, they obtained a total of 86 questionnaires, distributed as follows:

<b>Table Nº 5. Students per level, who participated in the study</b>	
<b>Level of the program</b>	<b>Quantity</b>
Second year	19 students
Third year	13 students
Fourth year	27 students
Fifth year	22 students
Several cyles	2 students
Graduated	3 students
<b>Total</b>	<b>86 students</b>

Source: Authors' elaboration

*Students' inclusion criteria:*

- ✓ To have completed one or more of the evaluated courses during 2008.
- ✓ To belong to Second, Third, Fourth or Fifth Year; or,
- ✓ To have done or being in the process of doing the profesional practice in 2009.

3.8. Data collection

To gather the information, three ways were used: an instrument (questionnaire), an interview, and documentary revision. They are explained below.

➤ Semi-structured, individual and group interviews

Based on the technique of semi-structured interview, a guide with specific questions was prepared. Also, the researchers had flexibility to include aditional concerns, as they were emerging at the moment of applying the interviews. According to Hernández et al. (2003), the purpose of this technique is to obtain more information about the topics of interest. When the

interviews were developed, the researches followed a guide that help them lead the process from beginning to end, in order to *"obtain a more determined and accurate information"* (Rodríguez, 1999, p. 243).

During different moments of the study, both individual and group interviews were conducted, as explained as follows:

<b>Table Nº 6. Developed interviews</b>	
<b>Individual interviews</b>	<b>Group interviews</b>
Dean of the Faculty Curriculum Commission Coordinator	Professors of the evaluated courses Professors of non evaluated courses

Source: Authors' elaboration

To guarantee the reliability of the gathered information, there are audio recordings of all the interviews and also verbatim transcripts of them; this allows the consulting of the original sources at any desired moment.

➤ Questionnaire

A questionnaire of open and closed questions was built, divided in sections that correspond to the categories of analysis previously established<sup>13</sup>:

- ◆ General information
- ◆ Information about the Faculty's Project
- ◆ Information about the Human Interactions
- ◆ Information about Aspects of the Academic Life
- ◆ Space for Observations, comments and recommendations

*Validity criteria*

The consultation with experts constitutes the criterion validity. To assure the criterion validity and the content validity, the instrument was revised by two professionals that work at the Academic Research Center (Centro de Evaluación Académica, CEA), one from Statistics and the other one from Education. Moreover, in the process of designing the questionnaire, the researches used already validated and applied instruments as a base. In addition, the content validity was guaranteed as the experts analyzed the items regarding its comprehension, form, and content.

---

<sup>13</sup> This was explained above in the Conceptual Approach.

*Reliability criteria*

To determine the instrument's reliability, a pilot testing was implemented with five college students who belong to different majors from the same university. This piloting allowed checking if the questionnaire gathered similar results, and if it was understandable for the students.

➤ Documentary Revision:

The researchers reviewed the following documents:

- ◆ The Faculty's educative project
- ◆ The self-assessment report
- ◆ The evaluated courses' syllabus

3.9. Methodological strategy

Below, the researchers describe the phases followed in the development of this study, which occurred as complementary and parallel steps.

➤ Subject related bibliographic review

With the idea of building a theoretical basis for the categories of analysis defined, theoretical works concerning the assumptions that uphold the Conceptual Framework were reviewed in order to serve as reference for the Faculty. This consultation of documents was constant through all the study. As explained by Angulo (2009):

The construction of categories of analysis requires a sufficient knowledge of the object, that is to say, an informative substrate that allows a first approximation, which implies that it won't be the first occasion in which the researcher approaches to it (p. 119)<sup>14</sup>.

➤ Definition of the categories of analysis

Before data gathering, the researches defined the categories and subcategories under which all the information would be analyzed, as explained as follows.

<b>Table N° 7. Research's categories of analysis</b>		
<b>Faculty's Project</b>	<b>Human Interactions</b>	<b>Other findings</b>
Epistemological position	Students-students	Emergents
Contents and curricular plan	Students-professors	
Learning strategies	Professors-professors	
Evaluation of learnings		

Source: Authors' elaboration

<sup>14</sup> The authors made a free translation of the text written by Angulo (2009, p. 119).

➤ Construction and validation of the questionnaire and the interview guide

After defining the categories of analysis; the researchers built a guide for both individual and group interviews. Then, they constructed the instrument that would be applied to students and, as mentioned before, it was validated through consultation with experts (peer review). Finally, the pilot testing application of the questionnaire took place.

➤ Participants recruiting

The professors were summoned through letters sent by the Dean of the Faculty. The students were identified and located through classroom visits, for which the researchers revised the courses' schedule to determine which groups to visit. In such way, it were visited one or two groups per level, as required to complete at least 20 students per year.

➤ Interviews development

The individual and group interviews took place in the Faculty, as well as in the authorities' offices, in the following dates:

<b>Table N° 8. Interview sessions</b>	
<b>Participant(s)</b>	<b>Date</b>
Dean	October 2008
Curriculum Comission Coordinator	October 2008
Professors of the evaluated courses	November 2008
Professors of non evaluated courses	June 2009

Source: Authors' elaboration

➤ Questionnaire application

The questionnaires were applied in-person to the group of students from Second to Fifth year, and virtually (via e-mail) to the group of students that are developing their professional practice. For the real-time application, the researchers visited one or two groups per level, as explained above, during the first weeks of the II Semester 2009.

➤ Information analysis

While the interviews were developed (both groupal and individual), the recordings were literally transcribed in a program for text processing. In parallel, the researchers classified the information according to the predefined categories, but also, it was systematized in a matrix; all of



these procedures were executed in order to facilitate the subsequent analysis. In the case of questionnaires, the researchers used the SPSS database, version 11.5. Based on the obtained results, the information was organized in charts. Finally, a content analysis was made, using the previously established categories.

### 3.10. Moments of the study

The phases described below correspond with the moments which took place during the courses' evaluation. It is necessary to clarify that many of the tasks were developed in parallel, not one after the other.

#### ➤ The Faculty's project

The objective of this analysis was to know the characteristics of the professional profile that the curriculum aims to look at the articulation of this great purpose of the Faculty with the implementation of the courses.

#### ➤ The evaluated courses

The objective of this phase was to gather the professor's thoughts regarding the categories and subcategories of analysis.

#### ➤ Data organization

With the objective of organizing, analyzing, and interpreting all the obtained information, this step was setted in a matrix according to the categories.

#### ➤ Writing the final report

The researchers did a final data interpretation, including the contributions of the results' validation. The process finished with the elaboration of the research's report.

## **4. Conclusions**

To implement a curriculum is a complex and multifactorial process, since it is an eminently human phenomenon. Many factors intervene in this process, which cannot be controlled because they depend on human interactions. In such way, when a curriculum is conceived as a response to a given situation, it is built a proposal that will be modified as it is implemented. For this reason, to assess a curriculum is essential in order to improve it.

Assessment can look into the curriculum's complexity as a whole, or specifically to one aspect of it. Nevertheless, it is always necessary to consider the interaction among the different curricular

factors, namely: the professional profile, the discipline's background, the courses and their didactic strategies, the resources, and especially the people who implement such curriculum (this means, faculty members and students).

In this study, looking at the ten courses' evaluation as a strategy to improve the curriculum allowed to demystify some prejudices that pointed out the teaching practice as the only decisive factor in student's academic performance. It demonstrated as well that the influence of the Faculty's curricular project, the human relationships, and other invisible factors determine in a very complex way the pharmacists' education.

In the following lines, the researchers share with the readers the study's main conclusions:

- ◆ Pedagogical processes are multidimensional. In them, people intervene with their interests and duties, but the infrastructure, material resources and the curricular proposal itself also intervene; in the present case, the curricular proposal of a major in the University of Costa Rica.
- ◆ People who participate in pedagogical processes are professors, students, and university authorities. They are the ones who experience the weaknesses and strengths of the curricular process. And, this curricular process, for the present study, is determined by the categories of analysis: Faculty's Project, Human Interaction and Emergents.
- ◆ This study followed a qualitative design, with the objective of making an approach to the curricular phenomenon of the evaluated courses. This allowed the researchers to look at the interaction among different aspects of the observed reality: professors, students, courses' syllabus, and institutional documents.
- ◆ The investigated phenomenon's comprehension, from a qualitative look, leads to a human vision that considers a perspective in which people are the ones who have the power to transform their context, so their ability to influence that professional education is gradually becoming more pertinent.
- ◆ Evaluation as a subject must be constant in the pedagogical processes, not from a splitted look toward a course, but from a complex look that aspires to include all the factors that affect learning: human interaction, the curricular project and emergents.
- ◆ Evaluating courses from a comprehensive perspective guarantees an analysis of pedagogical processes without the stigmatization of people, which leads these people to identify themselves with the results, and to spontaneously propose the improvement of their own pedagogical processes. All this feedback influences the continuous improvement of professional education and, therefore, the School's or Faculty's curricular project.

♦ In the specific case of the Faculty of Pharmacy, results motivated professors to reflect about their pedagogical practice, which generated a desire for innovation, both in an individual level of their own courses, as well as in a collective way, arriving even to reconsider the Faculty's Teacher Improvement Plan.

The courses' assessment in higher education, from a perspective like the one used in this research (namely: curricular, qualitative, and complex), promotes the construction of a self-consciousness about learning processes, which is developed in three actors: the Faculty as a unit, the professors, and the student body. In the Faculty, because the evaluation provides relevant information which is useful to know the accomplishment level of the desired professional profile, considering that as organization its mission is to achieve that purpose. In the professors, since the evaluation allowed them to know how far or close are their courses from contributing to such profile; also, because motivated them to look for constructivist didactic strategies that promote students' significative learning. In the student body, as they experiment a better education for their future professional life, given that is the population directly benefitted with the improvements made in the Faculty's educative processes. In such way, with this work became evident the complex network among actors in an academic unit, for which can be proposed the following analogy: the Faculty is the organization that sets the project's north, the professors are the ones who execute it, and the students are who receive it, all of which is affected by invisible bonds that relate it and move it, both internally and with the surrounding context.

This study's impact can be observed in the faculty member's openness toward understanding the learning process and the importance that didactic strategies directly respond to the needs from the professional profile chosen by the Faculty. This work offers a basic conceptual framework so they can develop innovations in their different spaces of academical education with students. Eventually, faculty will build, in a more sustained way, an innovative culture that demands students to think creatively and critically, to take decisions, and to solve professional problems, in such way that they will be better prepared to respond the challenges of the present society.

## **5. References**

- Altisen, C. J. (2009). *Epistemología: guía de estudio*. Argentina: Universidad Católica de La Plata. url: <http://www.librospdf.org/10265/epistemologia-claudio-altisen>
- Álvarez Méndez, J. M. (2005). *Evaluar para conocer, examinar para excluir* (2nd ed.). España: Ediciones Morata.
- Ángulo Villanueva, R. (2009). Acercamiento a la lógica curricular en investigación. In Berta Orozco (ed.) *Curriculum: experiencias y configuraciones conceptuales en México* (1st ed., pp. 103-133). Mexico: Plaza y Valdés Editores.

- Brown, S. & Glasner, A. (2003). *Evaluar en la Universidad: problemas y nuevos enfoques*. Madrid: Nancea Ediciones.
- Centro de Arte y Creación Industrial (2007). *Concepto: Emergentes*. url: <http://www.laboralcentrodearte.org/emergentes/concepto.html>
- Díaz Barriga, F. & Hernández, G. (1998). *Estrategias docentes para un aprendizaje significativo, una interpretación constructivista*. (3rd ed.). Mexico: McGraw-Hill/Interamericana Editores.
- Elboj, C., PuigdellíVol, I., Soler, M., & Valls, R. (2006). *Comunidades de Aprendizaje: transformar la Educación*. (1st ed.). España: Graó Ediciones. On-line version, url: <http://es.scribd.com/doc/8753122/Carmen-Elboj-Saso-y-Otros-Comunidades-de-Aprendizaje-Transformar-La-Educacion>
- Escudero, J. (1999). *Diseño, desarrollo e innovación del currículum*. (1st ed.). Madrid: Editorial Síntesis.
- González, V. (2008). La interacción formative: una posibilidad interesante. In: *Semanario Universidad, 1778* (XII), October 1<sup>st</sup> to 7<sup>th</sup>, 2008 (printed version). San José: Universidad de Costa Rica.
- Hernández, R., Fernández, C., & Baptista, P. (2003). *Metodología de la Investigación*. (3rd ed.). Mexico: McGraw-Hill/Interamericana Editores.
- Ivic, I. (2009). Lev Semionovich Vygotsky. In *Perspectivas: revista trimestral de educación comparada*, XXIV (3-4), pp. 773-399. Paris: UNESCO, Oficina Internacional de Educación. url: <http://www.educar.org/articulos/Vygotsky.asp>
- Lipman, M. (1998). *Pensamiento complejo y educación* (2nd ed.). Madrid: Ediciones de la Torre.
- Margery, E. (2010). *Complejidad, transdisciplinariedad y competencias: cinco viñetas pedagógicas*. (1st ed.). San José, Costa Rica: URUK Editores.
- Real Academia Española (2009). Emergente. In *Diccionario de la Lengua Española* (22nd ed., on-line versión). url: <http://www.rae.es>
- Rodríguez, C. (1999). La entrevista psicológica. In Delgado, J. M. & Gutiérrez, J. (eds.), *Métodos y técnicas cualitativas de Investigación en Ciencias Sociales*. (3rd. reimpr.) Madrid: Síntesis.
- Salazar, L., et. Al (2001). *La dimensión de participación en la sostenibilidad institucional*. Costa Rica: Proyecto ISNAR "Nuevo Paradigma", Serie Innovación Institucional.
- Santamaría Vizcaíno, M. A. (2005). *¿Cómo evaluar aprendizajes en el aula?* (1st ed.). San José: Costa Rica: EUNED.
- Sistema Nacional de Acreditación de la Educación Superior (2010). *Plan de Mejoramiento Docente*. San José, Costa Rica: author. url: [http://www.sinaes.ac.cr/proceso\\_acreditacion](http://www.sinaes.ac.cr/proceso_acreditacion)