

Modelos pedagógicos en Docentes de Ciencias Clínicas de la Universidad Tecnológica de Pereira-UTP, Colombia.

Pedagogical models in Professors of Clinical Sciences of the Universidad Tecnológica de Pereira-UTP, Colombia.

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Abstract

Objective: To characterize the pedagogical models used by clinical science professors of the medicine program at the Universidad Tecnológica de Pereira.

Materials and methods: Qualitative, descriptive research. Forty teachers linked under any modality (permanent, temporary or for hours) who had been carrying out their pedagogical activity for three years or more were selected. A semi-structured interview was conducted, which was endorsed by the Bioethics Committee of the Universidad Tecnológica de Pereira.

Results: 55% of professors have training in education or university teaching. 45% of teachers claim to use the problematization model, 37.5% do not know the model they use, 12.5% believe they use the technological model and finally 5% invoke the traditional model. Regarding the didactic material used, there were no differences between the groups of professors, all of them favored audiovisual aids, such as power point presentations and whiteboard. There were also no differences regarding the didactic methodology since the majority used academic rounds, clinical cases, and topic reviews. And at the time of the evaluation, everyone favored the written exam.

Conclusion: Most of the professors have some degree of training in education; All of them use a pedagogical model and although the majority identify it as a problematization model, it was found that, based on the didactic material

used, the way of transmitting information, motivating and evaluating the student and how it facilitates training, the tendency is to use a mixture of models, with the technological model predominating, followed by the traditional and problematization models.

Keywords: Pedagogical model, evaluation, methodologies, didactics, medical education.

Resumen

Objetivo: Caracterizar los modelos pedagógicos utilizados por los docentes de ciencias clínicas del programa de medicina de la Universidad Tecnológica de Pereira.

Materiales y métodos: Investigación de tipo cualitativo, descriptivo. Se tomaron cuarenta docentes vinculados bajo cualquier modalidad (planta, transitorio o catedrático) que llevaran tres años o más realizando su actividad pedagógica. Se les realizó una entrevista semi-estructurada que fue avalada por el Comité de Bioética de la Universidad Tecnológica de Pereira.

Resultados: El 55% de los docentes tienen formación en educación o docencia universitaria. El 45% de los docentes aducen emplear el modelo problematizador, el 37,5% no conocen el modelo que emplean, el 12,5% creen utilizar el modelo tecnológico y por último el 5%, invocan el modelo tradicional. En cuanto al material didáctico utilizado no hubo diferencias entre los grupos de docentes, todos privilegiaron las ayudas audiovisuales tipo presentaciones en power point y expógrafo; tampoco hubo diferencias en cuanto a la metodología didáctica ya que la mayoría utilizaron rondas académicas, casos clínicos y revisiones de tema; en cuanto a la evaluación todos privilegiaron el examen escrito.

Conclusión: La mayoría de los profesores tienen algún grado de formación en educación; todos utilizan un modelo pedagógico y aunque la mayoría lo identifican como modelo problematizador, se encontró que, con base en el material didáctico utilizado, la forma de transmitir la información, de motivar y evaluar al estudiante facilitar la formación, la tendencia es a usar una mezcla de los modelos, predominando el modelo tecnológico, seguido por los modelos tradicional y problematizador.

Palabras clave: Modelo pedagógico, didáctica, evaluación, formación médica.

1. Introduction

Medicine can be studied from many horizons and can be problematized from different concepts and methodologies; but when analyzing it both in private and social practice, the physician becomes the protagonist in the reflection of the training of professionals in this field. However, to critically investigate this issue it is necessary to think about the training model that medical schools have implemented in order to achieve the objective of training professionals in this field.

It is the doctors who, from beginning to end, “facilitate or limit” the integral training of the future doctor. The physician becomes a professor not necessarily because of his/her training in education, but because he/she “communicates knowledge” and manifests a power that confers him/her the knowledge acquired by his/her previous study or professional practice. When evaluating this transmission of knowledge with the student, the only tangible thing is a written or oral test that is graded according to the level of similarity of terms that the student manifests in his answers, with what the teacher transferred.

It is still difficult to know whether the competencies acquired in university training are sufficient to face the reality they will encounter in our society. Based on preliminary observations, one senses a predominance of a traditional way of teaching, which possibly facilitates that the transmission of medical knowledge is reduced to the transfer of a technique.

Tamayo (1) argues that, in this strong dominance of traditional teaching in health education, textbooks and oral interventions of teachers are easily found, reporting certainties with absolute conviction of their invariability over time (1,2,3,4). He affirms that, in this model, it is frequent to experience the expository master class enunciating postulates that rigorously follow the logical-deductive method, as the main didactic tool; thus demonstrating “that historically neither the knowledge nor the construction, judicious and premeditated of mental models by the students has been favored” (1).

Flexner, quoted by Vicedo (5), stated: “From the pedagogical point of view, modern medicine, like all scientific teaching, is characterized by activity. The student does not only watch, hear and memorize, he or she acts. Their own activity in the laboratory and in the clinic are the main factors in their instruction and disciplinary training”. Therefore, clinical practice has always been insisted on as the pedagogical tool with the greatest weight and with which medicine is humanized.

The training of the physician is based on obtaining solid theoretical foundations and the application of this knowledge in a laboratory, in a community or in individual clinical practice, supported by the tools that technology offers every day. Attention must be focused on the patient, thus strengthening the humanization of medicine, and bearing in mind that behind every disease there is always a face. It is worth remembering Sir William Osler with one of his famous phrases: "To study medicine without books is like sailing a sea without a chart; and to study it only in books is equivalent to not knowing how to sail"(20).

The learning environment must be conducive, and the provider of education must "ensure adequate encouragement and support" (6) to enable students to successfully pursue lifelong learning.

Therefore, in order to achieve the objectives proposed in medical education, medical programs use different strategies that allow them to efficiently face these challenges. These strategies are developed within a pedagogical model, which, in most of the occasions, is not consciously evidenced in such a way that its characterization can provide a first approximation to the description of the way in which local health education is being developed.

In modern Colombian medical education, four pedagogical models can be postulated that could configure the current curricular trends: traditional, technological, social, and problematizing (7, 8, 9). It is relevant to discuss some of the theoreticians who have worked on the subject and for the present study will be defined as Dr. Francisco Bohórquez¹ did, as follows (7):

1. Traditional model: Transmissive, rote, repetitive. The professor has knowledge that confers him power and authority. The student submits to the truth that dresses the professor and to the authority that she/he exhales every second. The didactic methodology is the master class where he/she routinely exposes their knowledge. What is known is more important than what is argued, analyzed, and inferred. The moment in which the student wishes to rediscover is underestimated. The transcription of knowledge is evaluated (7).

2. Technological model: behaviors that produce observable changes are learned. The professor uses the necessary resources to ensure learning, controlling the assimilation of contents pre-established by an educational system. The student must achieve "goals" in an unquestionable manner. The didactic methodology is established with group dynamics and practical activities using tools such as audiovisual aids, anatomical models, diagrams, algorithms, computer simulation of cases, electronic books, databases,

knowledge networks. The evaluation is done with psychometric tests, quizzes, and exams (7).

3. Social model: the professor is a guide for the student, making him/her aware of his/her role as a leader and active participant in the community. The student is critical of the social model and the prevailing knowledge. The didactic methodology is multivariate to ensure integral and liberating learning. The impacts, relevance and viability of new knowledge and technologies in our social, economic, and cultural reality are evaluated (7).

4. Problematizing model: the professor assumes the role of a motivator, facilitator and learning guide. The student participates actively to develop the capacity to deduce, relate and elaborate synthesis. It is a multi-teaching process emphasizing self-learning and self-training. The evaluation is carried out through self-evaluation, formative, qualitative and individualized evaluation (7).

Considering the approach in health education based on pedagogical models, there are experts who urgently propose a change of model, as Pinilla 1 (10) says: “that university education should distance itself from the classical positivist pedagogical model of teaching, whereby the student repeats and memorizes contents taught by the professor, where the professor’s discourse is prioritized”. Marton and Säljö, quoted by Pinilla, state that it is necessary to “transform the unidirectional teacher-student interaction into a dialectical bidirectional relationship in which memorized or repetitive learning is overcome in order to advance towards meaningful and deep learning” (10).

Based on this proposal, a new pedagogical model based on competencies with a constructivist approach that gives meaning to learning and the formation of the subject becomes important. For Denyer, “The teaching discourse is replaced by a teaching action that essentially consists of: a) guiding, rectifying and modeling the process of solving the task, and b) providing, finding or building, depending on the circumstances, the necessary resources for this resolution” (11).

With the change towards this type of model, the ideal of professional training can be approached, which according to Fernández “is the educational process that takes place in higher education institutions, so that a student obtains “knowledge, skills, attitudes, cultural and ethical values, contained in a professional profile and that corresponds to the requirements for a specific practice of a profession” (12).

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However, in order to understand the training of a professional in health sciences, it is essential to specify that pedagogical models are mental constructs; categories that describe and explain conceptions and teaching practices, allow structuring pedagogical themes, and show their meaning in the social context where they arise (13).

In health sciences, the usual has been the traditional positivist model, where students are not called to know but to memorize content; but the balance has been tilted since the mid-twentieth century to the present, towards a problem-based learning model (PBL), with a socio-constructivist perspective of learning; this has been used in an empirical and poorly defined way; A reflective analysis process is developed with the student to provide solutions to each clinical case, thus facilitating the development of clinical judgment as part of the professional competencies of patient care; therefore, the teacher uses the method of inquiry, reflection, analysis and posing of problem questions and possible answers according to medical knowledge and literature review to categorize the information and generate alternative solutions (10).

Similarly, Venturelli proposes “transforming methodologies and teaching strategies to interrelate basic sciences with clinical sciences and thus facilitate the development of professional competencies that integrate knowledge, attitudes and skills put into action to generate new and timely solutions in different problem situations of each profession” (15)

On the other hand, cohesion is expected between the pedagogical models implemented and the mission of the medical program. The same, in the program of the Universidad Tecnológica de Pereira is “to train professionals at the undergraduate level, focused on care, dignity and respect for the human being, through the development of medical knowledge, in harmony with the knowledge of public health, addressing the health problems of individuals and communities with a bio-psycho-social and bioethical approach, through the development of teaching, research and social projection, with highly qualified teachers, inspired by the humanized service in order to contribute to improving the quality of life of human beings” (16).

At the moment of evaluating the evolution of the student semester after semester and in different advisory committees of the medicine program of the Faculty of Health Sciences of the Technological University of Pereira, apart from the capacities with which the student enters the program and the admission criteria, we frequently hear comments focused on the need to strengthen competencies in a good number of students regarding the elabo-

ration of the clinical history of the patient, the diagnostic approach and the acquisition of an adequate clinical reasoning since they are considered essential components that supply the duty of the physician as healer and caregiver of the person. There is an evident concern and urgency to improve generic or transversal professional competencies, which refer to common knowledge of different professions, skills, and general attitudes: communication competencies, ethical competencies, on the one hand, and specific competencies such as clinical competencies for patient care and medical knowledge competencies, on the other hand (10,14).

The training of doctors in these competencies depends, among other things, on good clinical practice, a fundamental tool of the problematizing pedagogical model. This model is the one that allows the student to acquire knowledge, but at the same time to develop skills and attitudes, that is to say, professional competencies (10,14).

Thus, the question arose: What are the pedagogical models used by the teachers of Clinical Sciences of the Medicine Program of the Universidad Tecnológica de Pereira?

The research was justified since to date there is no study on the subject in this program; only suspicions. By characterizing the pedagogical models of the Clinical Sciences Professors, we can later compare these results with the professors' offices and the respective committees of the program, give an account of the diagnostic approach obtained and formulate proposals for a transformation in Medical Education. We were able to provide a first approach to the reality of local Medical Education and why not think that it is a faithful mirror of the national truth.

The present research was developed with forty clinical science professors of the medicine program, linked for three or more years to the program, who signed a consent form, authorizing to participate in a semi-structured interview designed with the purpose of visualizing elements that from the didactics, the relationship with the student, the methodology used, the evaluation applied, would allow to classify their practices within one of the four models mentioned; the professor also authorized the recording of their activities with students.

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2. Materials and methods

A qualitative, descriptive research was carried out to characterize the pedagogical models of a total of 61 active clinical science professors of the medicine program who had been linked to the institution for more than three years. Informed consent was obtained from 42, of which it was possible to interview 40. The interview was designed so that its terms could be handled by professors with or without training in education, based on the relevant parameters that would allow characterizing each of the models mentioned.

The categories of analysis proposed in the present work were: type of contract; nature of the subject; number of credits of the subject; whether or not he/she has training in education or university teaching; if he/she has training, what was the means used to achieve it; pedagogical model that the teacher considers he/she uses for teaching; didactic material he/she uses; means through which he/she transmits information and facilitates training; suggestions made to the student to obtain information about the subject and improve the training process; strategies used to motivate the student to learn; the way in which the subject is evaluated; criteria used to evaluate the academic round (as the main activity at the patient's side); satisfaction with the level of knowledge and training with which the student arrives at the subject.

3. Results

a. Categories:

1. Type of contract: Of 61 active teachers, 42 received informed consent and 40 were interviewed as follows: full-time: 6; part-time: 20; temporary full-time: 1; temporary part-time: 6; professor by hours: 7.

2. Nature of the subject: The aim was to correlate the nature of the subject with the pedagogical model used by the professor, but when the research was carried out, it became evident that all subjects in the corresponding areas are "practical".

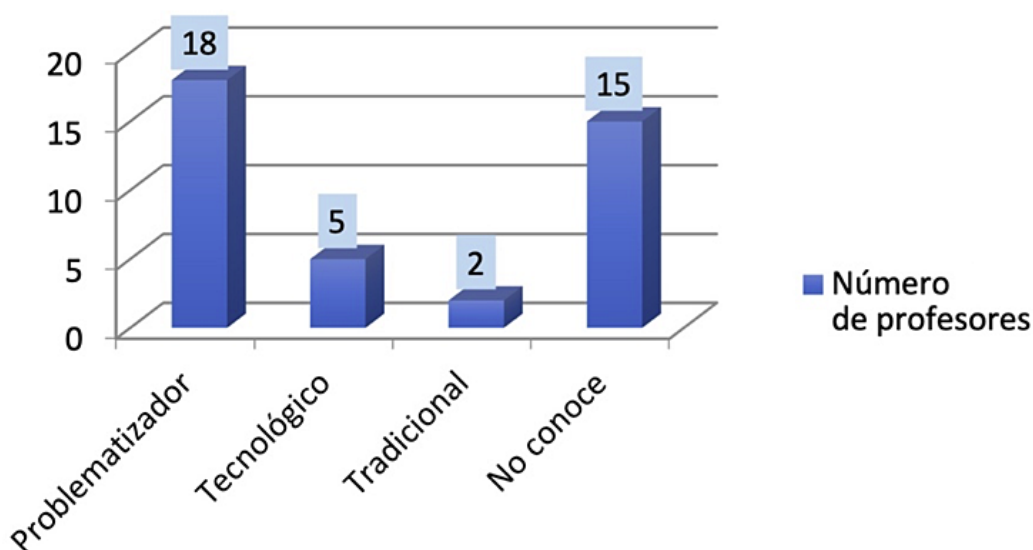
3. Course credits: The work yields a number of course credits ranging from 7 to 18.

4. Education or university teaching training: Professors with training in education or university teaching were 22 out of 40 (55%) and without training in education or university teaching: 18 (45%). There was a higher percentage of teachers with some level of training in this field.

5. Level of training in Education or University Teaching: Of the professors with training in education or university teaching, the following distribution was found: Diploma: 7 (31.81%); Specialization: 4 (18.18%); Master's degree: 1 (4.54%); Doctorate: 1 (4.54%); others (virtual modality): 9 (40.90%).

6. Pedagogical model that the teacher says he/she applies: Forty-five percent of professors claim to use the problem-solving model, 37.5% do not know which model they use, 12.5% believe they use the technological model and, finally, 5% invoke the traditional model (**Figure 1**).

Figure 1. Pedagogical model (from the teacher's point of view).



It can be seen that the majority of teachers believe that they use the problematizing model, followed by the technological model and finally the traditional model.

b. Didactic resources.

In order to make student learning effective, the material used by the professor for teaching was reviewed, showing a higher percentage of use of PowerPoint type presentation programs, followed by the use of the white-board, and to a lesser extent the use of posters and other tools specified by the interviewees, such as: scientific articles, management guides, consensus, material prepared by the professor, videos, booklets, virtual courses designed by the professor, role-playing games, Internet, discussion, concept maps, “the patient”, evolution notes, atlases, texts, as can be seen in **Table 1**.

Tabla 1. Pedagogical model according to the professor and didactic material used

Model (according to professor's perception)	Power point presentation	Whiteboard	Poster	Others***	Number of teachers who say they use this pedagogical model
Problematizing (45%)	14	12	6	7	18
Technological (12,5%)	5	3	2	3	5
Traditional (5%)	2	1	1	0	2
Don't know/don't remember (37,5%)	11	8	4	3	15
Total	32	24	13	13	40

***Other materials used for teaching:

1. Scientific articles, guides, consensuses, virtual material designed by the teacher.
2. Videos.
3. Own booklets.
4. Virtual modality: course designed by the professor.
5. Videos, role-playing games.
6. Internet presentations.
7. Literature with material written by the professor.
8. Conversation "spoken word".
9. Concept maps, Cartesian, Socratic model: question directed to the problem.
10. The patient and the evolution notes.
11. Atlas, texts.

c. Didactic methodology.

The strategies employed by teachers are academic rounds, clinical cases, topic reviews, seminars, case simulations, journal clubs, master classes and others such as film forums, workshops, introduction to the student in the mechanics of the institution, discussions, and support groups. Table 2.



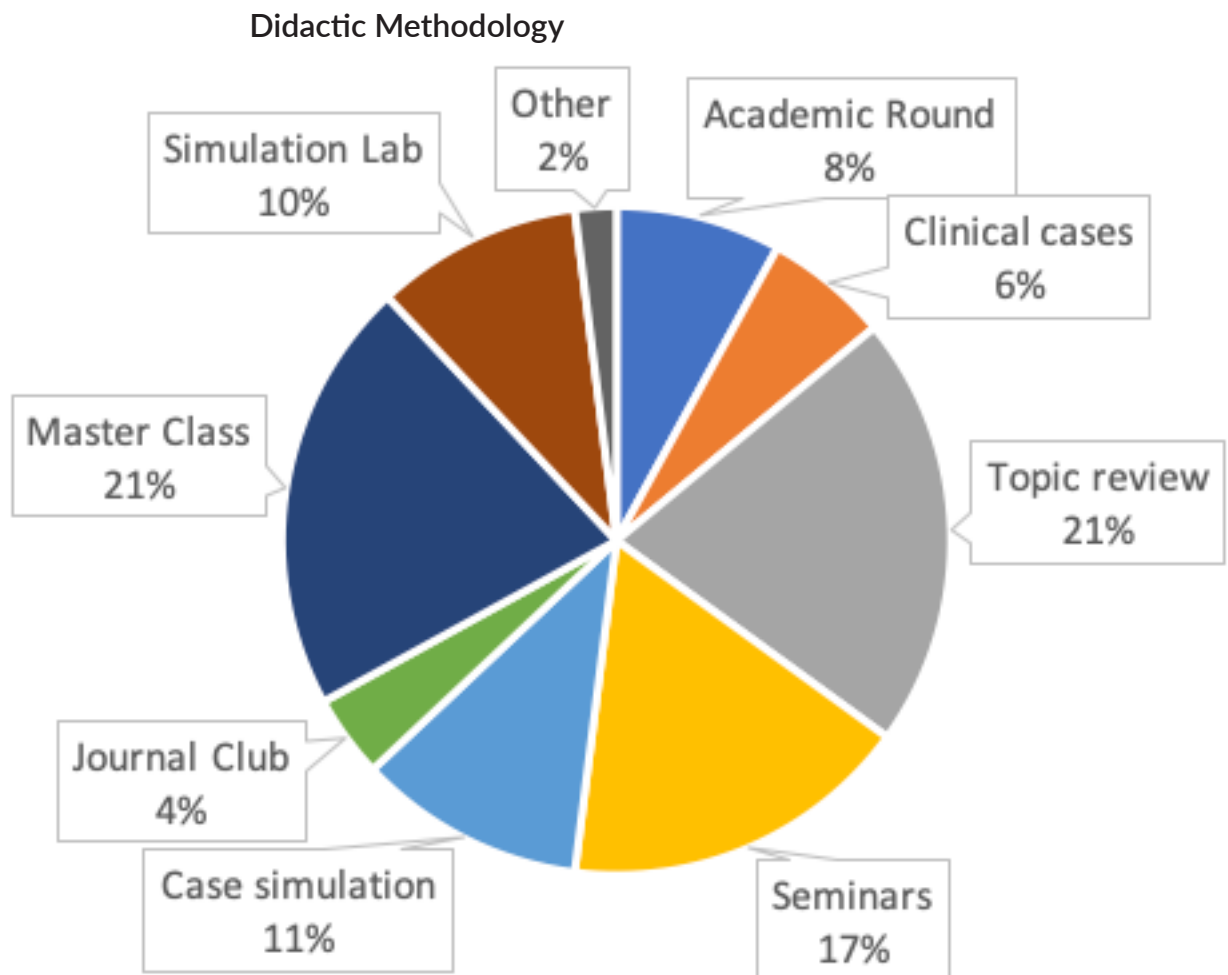
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Table 2. Didactic methodology used by the professor

	Didactic strategies	Frequency of use by the professors interviewed (percentages)	
1	Academic round	38/40 (95%)	
2	Clinical cases	38/40 (95%)	
3	Topic reviews	36/40 (90%)	
4	Seminars	33/40 (82.5%)	
5	Case simulation	27/40 (67.5%)	
6	Journal Club	23/40 (57.5%)	
7	Master class	20/40 (50%)	
8	Simulation laboratory	7/40 (17.5%)	
9	OTHER		
	9A	Workshops	2/40 (5%)
	9B	Introduce the student to the mechanics of the institution	1/40 (2%)
	9C	Cine-forum	2/40 (5%)
	9D	Consultation and intervention	1/40 (2%)
	9E	Conversation	1/40 (2%)
	9F	Support groups	1/40 (2%)

As can be seen in the table, most teachers use many strategies simultaneously as academic rounds, clinical cases, topic reviews and seminars in their order; however at the time of the development of the subject, the greatest weight they gave in terms of frequency of employment in the teaching-learning process, were the topic reviews and lectures, followed by seminars and simulation of cases, to finish with the academic round, clinical cases, journal club and others such as: workshops, cine-forums, introducing the student to the mechanics of the health care institution, consultation and intervention, conversation and support groups, as shown in **Figure 2**.

Figure 2. Percentage distribution of didactic strategies according to the value assigned by the teacher in terms of frequency of use in the teaching-learning process.



d. Suggestions made by the professor for the student to obtain information about the subject and improve the training process.

They were classified into three subcategories as follows:

1. Closed: It is the one in which the professor gives the material to the student about which he/she is going to consult; examples: “I give them very punctual bibliography about each topic”, “I send them articles by mail”, “I give them virtual or physical bibliography and I make them present topics”, “I review the basic paths that they have in which guide texts appear”, “I use historical characters for some pathologies and books of universal literature to estimate some pathologies; Hamlet, Little Prince. Romeo and Juliet; the player”, “I assign texts, bibliography”, “that they read the UTP page and the blog, I give them a page or an article on trends in training in my subject”, “I give them adequate bibliography”, “I give them information on

the subject and classes”, “I give them films, books, articles, I highly recommend “method”, concept maps”, “I give them texts and articles and assign homework”, “assigned bibliography and articles”, “every day they must prepare patients with complete clinical history”, “everyone must prepare topic”, “bibliography, blog of the subject, own articles”.

2. Guided: The one in which the professor guides the student through different possibilities for their training process and the student chooses one(s); some examples are: “I guide them in specific search engines: pubmed”, “reading; journal club”; “categorize the literature; consult in English”, “search in the network for current information”, “search in guide texts and based on this, search in different databases”, “everything they see in the patient should be reviewed in the bibliography: basic texts and classic journals”, “indications on organizing time; reinforce the basic ones; go back to the basic texts”, “I give them the bibliography and send them to review the old “parasites, physiology”, “internet search, databases, empirical and theoretical “lots of information on the patient, family and context and contrast the information with the case or cases”, “bibliographic review of each topic seen, follow-up of the cases seen”, “that they read every day on the topic of clinical history they see from different authors”, “recommendations of web pages, bibliography, classic texts”, “review of basic texts and two or three bibliographies to expand more”, “films focused on the subject and make the clinical history to the character”, “I recommend updated bibliography”, “own documents”, “I teach bibliographic search and interpretation of articles”, “bibliography on specific topics”, “bibliography on specific topics”, “I teach bibliographic search and interpretation of articles”, “bibliography on specific topics”.

3. Open: In which the teacher gives total freedom to the student for consultation and expansion. The arguments that support these categories are as follows: “internet search”, “reading about pathology seen in the patient”, “self-study at home”, “student work of four hours for two hours of the teacher”, “reading”, “discipline with time”, “self-training”, “compliance with scheduled activities”, “updating”, “that if they incorporate what they learn, someday it will be useful”, “research”, “media: web, blogs, articles, digital magazines”, “search in scientific portals and consult bibliography specific to the area”, “bibliography, books and study”, “whatever they find freely”, “previous reading, basic books, internet”, “I teach them to use UTP database and pubmed”.

According to the above, the guided subcategory predominated, followed by the open subcategory and, to a lesser extent, the closed subcategory.

e. The way in which the professor motivates the student to learn.

Regarding the expressions used by the professor to explain the way in which he motivates the student to learn, different approaches were observed, as follows:

1. Focused on the BEING: This approach is supported by the following arguments: motivation (#2), passion (#4), individualize, personalize (#3), by example, with my attitude (#6), valuing (#3). (#: refers to the number of professors who referred to the term).

2. Focused on KNOWING: Supported with the following arguments: questioning (#2), understanding the subject, assimilation, understanding the complexity of the subject, detecting knowledge deficiencies, knowledge (#6).

3. Focused on DOING: Supported with the following arguments: workshops, doing good for society, doing good for the medical act, proactivity, goals, reading, case interpretation, literature, rounds (#6), physical exam, clinical, patient examples (#8), teamwork, seeing patients, clinical problems, making your deficiencies visible, practice.

It can be interpreted in this way that most of the teachers' motivation is focused on DOING, then on BEING and finally on KNOWING.

f. Evaluation.

How does the professor evaluate the teaching doctor? The 40 professors answered with these two modalities: oral exam, written exam, or both, to evaluate the "theoretical" part of the subject. The oral exam deals with theoretical concepts and the written exam is mostly a multiple-choice test.

Table 3.

Table 3. Method of evaluating the subject

SUBJECT EVALUATION				
Distribution by MODEL (according to professor's perception)				
Model	ONLY ORAL EXAM	ONLY WRITTEN EXAM	USE OF BOTH (oral + written)	TOTAL
Problematizing	6	12	0	18
Technological	0	0	5	5
Traditional	1	1	0	2
Not Known	0	5	10	15
TOTAL	7 (17,5%)	18 (45%)	15 (37,5%)	40

The table shows how forty professors evaluate the subject in terms of its theoretical component, according to what was stated in the interview, with oral and written exams. The professors who say they use the technological model evaluate in both ways, as well as those who do not know which model is used.

It was found that the vast majority of the professors conducted a written exam (45%). To evaluate the “practice” of the subject indicated as the Academic Round, the following were the criteria mentioned by the professors to evaluate this activity; they were classified in three criteria (**Table 4**)

Table 4. Criteria to evaluate the academic round

CRITERIA (from least to most used)	ARGUMENTS			
From knowing (cognitive)	Analytical skills (#12)	Clinical concepts (#11)	Interrelation of clinical and epidemiological (#1)	Problem solving skills (#1)
	What was learned again (#1)	What was re-signified from what was known (#1)	Knowing (#1)	Cognitive (#2)
From doing	Semiology skills (#4)	Medical history management (#10)	Patient behavior (#3)	Aptitude (#5)
	Patient education (#1)	Knows how to apply protocols (#1)	Know to do (#1)	Systematic observation (#1)
	Patient presentation (#8)	Topic presentation (#9)	Practice (#4)	Communication (#2)
From the being	Own criteria (#2) Fulfillment of obligation with Hospital Universitario San Jorge (#1)	Doctor-patient relationship (#8) Responsibility (#6)	Participation (#8) Restlessness (#5)	Attitude (#13) Motivation (#6)
	Discipline (#2)	Attendance (#4)	Task accomplishment (#5)	What moved you (#1)
	Student challenges (#1)	Punctuality (#7)	Respect (#4)	Solidarity (#1)
	Being (#1)			

#: refers to the number of professors who used the term

Therefore, at the time of evaluating the academic round, greater importance is given to arguments that have to do with being, then with doing and finally with knowing.

g. Satisfaction with the student's level of knowledge.

Finally, the professor's satisfaction with the level of knowledge with which the student arrives to his subject was investigated, finding that 70% of the professors are not satisfied, 17.5% are satisfied, 10% say "more or less"; referred by some of them as "50/50" and one professor mentioned that "he is interested in being and not in knowing".

In addition to the semi-structured interview, twelve films were made of activities developed by twelve teachers respectively, where it is possible to appreciate the way in which they develop activities named by them as seminars (three), clinical case (two), journal club (two), topic reviews (four) and a master class. It is noteworthy that, in all the activities, the expository system predominates; there is information that, resembling the master class, is transmitted by the professor and in the other moments by the student; topic presentations are made each time. There is little or no intervention by the assistants.

4. Discussion

This study was designed to find out how the student training process in clinical sciences is being carried out, with respect to the models used by the professors. Our findings showed that all professors adopted a methodological structure compatible with a mixture of known pedagogical models, among which the technological model was favored followed by the traditional one.

When it comes to impacting student learning where specific skills such as clinical skills are present, it must be kept in mind that there must be multidisciplinary elements that underlie decision making and, therefore, are not simply reduced to a technical skill, which makes this objective a complex task. Using a mix of pedagogical models could alleviate this situation to some extent because it would give the opportunity for different learning styles of

« *Our findings showed that all professors adopted a methodological structure compatible with a mixture of known pedagogical models ...»*

students to find the possibility to develop adequately. Already a recent study conducted to investigate the usefulness of teaching methods in evidence-based medicine showed that there was no difference in knowledge and skill outcomes between the use of a mix of methods versus the traditional one; however, students who were exposed to the mix of methods perceived to be more self-effective in the application in the clinical setting (17,18,19).

It should be noted that according to what was found in this study, the adoption of a model was independent of the professor's training in education, and that in most of the cases the denomination of the model by the professor did not coincide with its characterization from the different elements used to put it into practice. There is a tendency to think that physicians have an inherent capacity to transmit their knowledge; however, specific training in education could contribute in some way to the reflection on their role as professors. This aspect was studied in Chile by evaluating a teacher improvement program where they concluded that teachers who were exposed to this program significantly improved their pedagogical work in multiple aspects, which had a positive impact on student achievement (18).

Despite the fact that the professor's conception of the model he/she is executing does not coincide with his/her practice, just reflecting on this model, its implementation, satisfaction and efficiency, generates a change that favors the teaching-learning relationship in several aspects (19,21).

According to the findings of this study, it is pertinent that professors in the medical program have training in education so that, among other reasons, they can recognize the pedagogical model they use and, even if they do not follow one exclusively, they can reflect on their work as professors, especially when they encounter difficulties in the teaching-learning process.

It should be noted that it is not necessary to categorize the professor in any model, but at least to increase the use of the problem-based model, mainly when for several decades, different authors have been arguing and emphasizing the need for a shift to this model to achieve clinical competencies in the future physician and humanize medicine. In fact, since the 1960s, a group of medical professors from McMaster University, Canada, recognized that it was necessary to modify the positivist approach to teaching medicine by content, for the constructivist Problem-Based Learning (PBL) model and thus achieve a better training for professional practice. This is due to the excessive production of scientific knowledge and technological advances that produce a constant change in the professional competencies that a professional must

demonstrate (5,9). Increasing the student's contact with his patient in any of the different scenarios will probably motivate him to participate actively in his training process and develop the ability to deduce, relate and elaborate synthesis. It is here, for instance, where the academic round takes on invaluable importance, since the professors placed greater emphasis on the valuation of the BEING in their students, in terms of the evaluation of this activity.

Within the problematizing model, it is necessary to recover and strengthen the academic round as the main training element for students; there they will learn to inquire, identify problems, and reflect on them. Perrenoud affirms that "the construction of a reflective posture through a clinical procedure, such as the practice at the bedside, or where appropriate in other human professions, is not a simple exercise of application of the acquired knowledge; it is at the same time a work of construction of concepts and new theoretical knowledge (at least for the student) from specific situations" (21,22).

Le Boterf, quoted in Perrenoud (21), maintains that it is a work of integration and mobilization of the acquired resources, creator of competences.

There is no coherence with respect to the model that professors believe they use with the model that is evidenced by the characteristics used, such as the role they assume with the student, the role played by the student in the teaching-learning process, the methodologies they use for the development of their subject, the way they evaluate their students and the didactic tools used for the pedagogical process; The final results show a contrast between the problematizing model they believe they use with a technological one, which is the one that is actually demonstrated, followed by a traditional model supported by the twelve films obtained, which show an expository transmission of knowledge.

It is interesting to note that professors actually use more than one model at a time and that models such as the traditional one are still in force and have a good weight in the pedagogical act.

5. Conclusions

The implementation of a specific pedagogical model does not depend on a professor's training in education, in view of the lack of coherence between the model that was intended to be followed and the way it is carried out in practice.

Most professors implement the written exam for the sake of "time optimization" and greater "objectivity" in the words of the interviewees. Predominance of the multiple-choice test.

It was found that the teaching staff is very interested in implementing the best pedagogical way to accompany students in the development of their professional competencies, since they all use a methodological structure with defined elements and characteristics, regardless of whether or not they coincide with the name they give to their model.

Although at the time of the interview with the professors there was a presumption on their part of a greater use of the problem-solving model, it is evident from the data obtained that there is a greater tendency to use the technological model supported by a greater orientation of the professor to use the necessary resources to ensure learning, control the assimilation of the contents previously established by him or the teaching staff and the achievement of goals by the students.

There is a lack of coherence between teaching didactics and evaluation strategies; more value is given to conceptual knowledge than to the evaluation of integral competencies projected to professional practice.

The traditional model is still in force since master classes are practiced by 50% of the professors.

It should be noted that although the vast majority of professors focus on BEING, in addition to DOING and KNOWING as criteria for evaluating the Academic Rounds, these are not the core activity of the subject, and more weight is given to lectures, topic reviews, seminars, and other activities.

Most professors do not favor a particular pedagogical model, but rather a mixture of the best known existing models.

6. Recommendations

It is useful for the clinical professor to have training in medical education, in order to be able to discuss and reflect on the teaching-learning process and make the desired changes with the objective of achieving comprehensive training for the student.

It is time to ignore the positivist benefits of the traditional Flexnerian model, focused on the transmission of content, leaving aside the famous phrases of students who justify their scarce contact with patients: "it is that there is a lot of subject we have to review"; "I have to win the exam" and "win the sub-

*«The traditional model is still in force
since master classes are practiced by 50%
of the professors.»*



ject”; to give way to a clinical model; problematizing model, predicting success in the integral formation of the student, with adequate clinical reasoning and critical thinking. It is possible that once the professor knows the scope of this emerging model and identifies all its characteristics, it will become the pillar of training; and although it may use some elements of other models, it must be consistent with the base model for comprehensive training.

If a certain number of medical schools (for example, for several years now, those of Geneva and Lausanne in Switzerland, those of Laval and Sherbrooke in Canada), try to break with the accumulation of knowledge before the confrontation with clinical cases, by placing simple cases from the first week of the first year, giving adequate time for the student to identify and assimilate the concepts and knowledge necessary to provide him/her with the best devices to solve the problem, ruling this training by a logic of problem solving conceived and proposed by the professors, where the students build little by little the theoretical and methodological resources necessary to solve the problem of the moment (15), why can't we start in the same way to speed up the reflective moment in the student?

It is necessary to integrate the basic with the clinical as soon as the student begins his training. What will be the best way? How to replace theory with action? We propose an academic chain where the first semester student has contact with students of higher semesters (III, VI, VII, interns, Residents) and thus with their peers can give more meaning and emotion to learning and a true integral formation.

We must evaluate the physician's motivation to perform his or her work as a professor because it can have a considerable influence on the student's learning. There is a validated instrument in the literature for this purpose called the “Physician Teaching Motivation Questionnaire” (PTMQ) (22).

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