

Application of Problem-based Teaching in Medical Microbiology and Parasitology of career Medicine

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Abstract:

Introduction: The application of Problem-based Teaching requires teaching skills to identify content contradictions and create problematic situations, so that they are assimilated by students as teaching problems which will be solved in class, while they assimilate new knowledge. In the subject of Medical Microbiology and Parasitology belonging to the Diagnostic Media discipline, at the Victoria de Girón Faculty, this approach, of proven effectiveness, had not been systematically used.

Objective:

To explain the methodological work path that allowed the application of Problem-based Teaching, in the subject of Medical Mycology, of the subject of Medical Microbiology and Parasitology, based on the results of previous research.

Methods: Through the inductive-deductive method and documentary analysis, the teachers of this subject assimilated previous experiences, which allowed them to apply a consistent teaching-methodological work, in order to bring this type of teaching to their classes, with the application of a methodological system to develop didactic-descriptive guides, as models to develop the classes.

Results: The methodological work used allowed the group to prepare guides for the conferences and practical classes, which would allow them to apply Problematic Teaching, by adapting an established methodological system to the conditions the higher level, in Medical Sciences.

Conclusions: It was demonstrated that to use Problematic Teaching, a methodological work must be developed that organizes the identification of contradictions and the writing of teaching problems, to develop classes with the use of the categories and methods of this didactic conception.

Key words: zeolite; squalene; vaseline; itching; inflammation; skin lesion

Introduction

Since the creation of the Institute of Sciences Basic and Preclinical Victoria de Girón (ICBP) in 1962, the designs curricular in science courses Female doctors have gone perfecting and the teachers they have reached remarkable experiences in the development of Educational Didactics Doctor, in the purpose of achieving higher quality in the training of professionals for care primary health and raising the level scientist of his students. [1]

This improvement in Teaching Medical has been nourished by results theoretical and practical contributed by research educational in the different levels educational, both from Cuba and others contexts foreigners, which has required an update constant in preparation methodological of the teachers. [2]

At the same time time, Teaching Medical demands that the students assimilate, not only the knowledge, but also others elements of the teaching content, such as attitudes, feelings and the approaches ideological, among others values, which contributes to the establishment of relationships consistent between the knowledge basic and those of the area clinic, and this has to occur from the first years academics, as they understand it the professionals in the fields of education sciences Medical, and that is how we work so that the students are motivated by carry out an apprenticeship aware of the teaching content, in the process teaching-educational.[3]

However, the collective pedagogical of the subject of Microbiology and Parasitology Doctor at the ICBP Victoria de Girón in the last courses

schoolchildren permission appreciating that many students who showed themselves selfless by the disciplines of science basic , by not warning appropriately the relationships of theory with practice medical , which caused a lack of motivation , reinforced by adopting the habit of learning by heart the concepts that were made known at the conferences , so they were not trained systems coherent knowledge , nor were they integrated with the remaining contents of others subjects of the same cycle essential.

In fact, in this Microbiology and Parasitology subject Medical has to be generated a relationship theoretical-practical further narrow, because brand a transition between the knowledge theorists and their application in the functions of prevention, diagnosis, cure and rehabilitation of the patients, in the case disease - specific originated by agents biological, and in this sense, must exist an expectation by part of the students, by to start in aspects core of its career [4]

This important relating function the knowledge theorists with their application in practice medical and achieve it through work methodological supported in the Didactics of Education Medical, committed to the teachers of this subject, starting in 2017, to be developed in the classes, conceptions didactics that were proven effectiveness in the formation of thought investigative, so necessary for the activity of the comprehensive general practitioner. From this problem methodological, the Professors of Microbiology and Parasitology Doctor, they started a work in favor of the employment of Teaching Problem, which, supported in the themselves principles of Didactics, was recognized in Cuba and others areas educational, by his effectiveness in assimilation, by the students, of knowledge solid and durable, although there was no enough research examples educational for the purposes of fostering relationships theoretical-practical.

In this sense it was decided that, when applying this type of teaching, could achieve improvement in the study aware of the futures doctors, from their own lectures and classes practices, in order to achieve motivations by assimilate the items theorists and see his relationship with the practice of your application to the clinic [5,6]

When carrying out a review of research papers educational developed with the Teaching employment Problematic, from its introduction In Cuba, in 1984[7], there were many contributions to the enrichment of their theory, so as confirmation of his utility in the process of assimilation of the knowledge in the classrooms of General Education. To the very time, they met in the bibliography contributions referring to skills teachers for their development, for what was missing investigate as could be checked its value in the development of all the members of the teaching content in Education Medical and in subjects of the comprehensive general physician training, from the science studies basic. [8]

Precisely , the definition of Teaching Problem adopted in this work , and that is based in the description of how This class is developed , allowed understand the significance of the revelation of contradictions , which made him identify himself precisely as an obstacle he finding of those items opposites of the teaching content , as well as the way to reveal them to the students at conferences and so on as others forms of organization of teaching , in order to create situations problematic , which are considered as he central link of this conception didactic . This definition raises:

“The Teaching Problematic is one conception of the process teaching-educational in which the students face the aspects opposites of the object of study, revealed by the teacher and the assimilate as issues teachers, whose solution is made through tasks cognitive and questions that contain also elements of problemativity, with which they appropriate them new knowledge, in his dynamic, through the use of methods teaching problems.” [9]

When considering this made in light of the Didactics of Education Medical , first of all it was necessary to start from research educational previous to organize he work system methodological further appropriate

in the field of Education Medical , in order to achieve his fit for purpose agreed, through work teaching-research, which was not to lead the students to solve problems applying knowledge already assimilated to situations new, as it had been conceived this type of teaching previously, (10) but motivate the students to the discovery of the knowledge new and that these were related, the most possible, to the actions practices of the doctor, to diagnose, to explain to the patients and family members about the entity pathological, indicate treatments, give them follow-up and feeling useful as Medical professionals, from his own training basic . [11]

For this, it was necessary to do a job methodological solid, supported in theory and in the research results precedents.

The objective of this article It is precisely to explain the way used to organize and develop this job methodological that allowed the application of the Teaching Problem in lectures and classes practices of Topic III of Mycology Medical subject Microbiology and Parasitology Medical, based on the research results previous.

Therefore, this collective considered that the job methodological started, would extend throughout the school year for everyone the topics of the subject, during he which would be made the documents that would be used as models, and in other investigation related to the results of this job methodological, would be taken to the classrooms, the classes So prepared, in order to check his effectiveness.

Methods

The work methodological was developed in the Media Department Diagnostics , from the Faculty of Sciences Victoria de Girón Medical School, throughout the 2017-2018 school year, by teachers who constitute he collective of the subject of Microbiology and Parasitology Doctor, with the purpose of conceiving and developing the classes by Teaching Problem in different forms of organization of the process educational-teaching, based on Topic III Mycology Medical, to subsequently develop an investigation educational, in the successive courses schoolchildren, having in note that the registration and the number of groups fluctuates, in correspondence with dissimilar people factors .[11]

Through the documentary analysis method and consultation techniques to specialists, confronted each other the requirements prior to carrying out the transformations relevant in the conception of the process teaching-educational, which they assumed modify the work styles teacher to create new classes in which I had to underlying the problematic, as relationship rational between the known and the unknown. [12,13]

Through the method inductive-deductive were studied experiences previous about the Teaching employment Problem originated in the same center, so that it would be carried out a decision relevant to the characteristics of the topics , their objectives, the potential of the groups to assimilate these changes and others factors [13] and were searched for others publications referring to the contributions obtained through research pedagogical previous ones, which contributed to the enrichment theoretical and practical of this conception didactics .[14]

The relevance of assuming was estimated a methodology already existing , taken from an investigation educational with primary groups , in science subjects , to develop classes with this approach , and achieve the drafting of instruments called guides didactic- descriptive classes by Teaching Problematic [15,16] and through the method analytical-synthetic , an adjustment was made to the categories and the methods of this type of teaching , which facilitated he management methodological contributions background referring to your application to practice .

It was adopted as the definition of Teaching is valid Problem of the author Guanache, AS.[9] so as the methodology created by this author , [16] whose first steps indicated he in-depth study of the content scientist on which it is based he teaching content of the topic that would have to be planned , and this , together with the search for curiosities , news , facts surprising related to this content , in books , magazines , newspapers and

others sources , allowed find numerous curious facts that led to the development of the guides that were to be written for the development of each class .[17,18]

The gradual derivation of the objectives, in relationship with those in the program, as well as the analysis of the subject's skills system, in his correspondence with the actions necessary for the assimilation of the concepts further general information on the subject of Mycology Medical. In this analysis had the identification of the system of concepts is of capital importance new for the students, those who were noted carefully, so that they had correspondence with the contradictions that were finding in these items scientists brought to the content of the subject program. [17].

They were determined the experiments, demonstrations and jobs practical, as well as others activities experimental related to the concepts of one's own theme, that they were feasible to be carried out in class practice, with which they identified those that would best fit each content. [16,17].

The recommendations of the methodology were followed adopted, with which were identified the contradictions with the highest level of generalization so that they constituted the issues teacher's general information on the subject or each of its headings, and proceeded so to write each one of the guides. (16)

It was lent a special attention to the aspects related to the ethics of the profession, in the time of writing each one of the guides, since these would remain as research instruments and at the same time, its results. Within this methodology was made emphasis on the different ways to reveal contradictions to create situations problems, due to various classifications that could be find in the bibliography employee. (19)

All the work process methodological with the Mycology topic, the search for contradictions and the writing of guides didactic- descriptive classes by Teaching Problem was mediated and supported ethically by exchanges of opinions between the participants and development of productive debates, typical of a job methodological centered in the changes that had been intentionally made proposed the collective of the subject. [18,19]

Results

8 working sessions were held methodological throughout the school year.

The group assimilated the essence of Teaching Problematic, unlike

Contenidos	Contradicciones
Características de la reproducción de los hongos patógenos.	Al estudiar los hongos, los biólogos especialistas en este reino han descubierto variadas formas en que se reproducen, como, por ejemplo, mediante diferentes tipos de esporas y otros, que son denominados comúnmente, levaduras, presentan también una reproducción por gemación. A pesar de que este campo de estudio es importante para los biólogos, a los médicos les interesa muchísimo las formas en que se reproducen los hongos patógenos. ¿Por qué puede tener tanta importancia para el médico conocer cómo se reproducen los hongos, si este no es su campo de estudio?
Las dermatofitosis, comúnmente llamadas tiñas	Las dermatofitosis, comúnmente llamadas tiñas, son un conjunto de micosis superficiales, afectan la piel, específicamente la epidermis y sus anexos (uñas y pelos). Son causadas por un grupo de hongos parásitos de la queratina. Si todos los seres humanos tenemos queratina en la piel, es de pensar que todos estamos expuestos a una dermatofitosis, pero no es así. Entonces, ¿cómo es posible que solamente algunas personas desarrollen esta micosis y otras no?
El agar Sabouraud	El agar Sabouraud es un medio de enriquecimiento para el cultivo de microorganismos, que, en determinados casos, se convierte en un medio selectivo que favorece el crecimiento de los hongos, sobre las bacterias. Si este agar se utiliza sobre una placa de Petri y constituye un sustrato enriquecido para cultivar microorganismos, ¿por qué el agar Sabouraud favorece específicamente el cultivo de hongos y no el de bacterias?
Micología Médica	La Micología Médica es una de las áreas de la medicina, surgida por la necesidad de tratar enfermedades provocadas en el ser humano, a partir del consumo o interacción con los hongos. Pero a pesar de los grandes avances en el estudio de la Micología Médica y el uso de anti-fúngicos o antimicóticos, la incidencia de infecciones fúngicas es muy elevada. ¿Por qué siguen siendo tan elevadas estas infecciones, si la Micología Médica ha experimentado grandes avances?
<i>Candida albicans</i>	Una paciente presentó una lesión escamosa en la piel debajo de los senos y el facultativo le indicó un medicamento contra el hongo <i>Candida albicans</i> . Ella dudó de que estuviera infectada por ese hongo, porque no había tenido ningún contacto con otra persona que le hubiera contaminado, ni había padecido de esa afección en ninguna otra parte de su cuerpo; sin embargo, el diagnóstico fue totalmente acertado. ¿Cómo es posible que fuera acertado el diagnóstico, a pesar de que no hubiese tenido contacto anteriormente con esa infección micótica específica?

Learning Based in Problems that had been used in Sciences Doctors until the moment, [10] which facilitated the search for about 26 content contradictions that could be to expose or reveal in he during the classes in the Mycology topic Medical. Those with the highest level of generalization were included in the activities of the beginning of the topic and the epigraphs , according to their adjustment to the content of these ; [15] the remaining contradictions were included in nails cards that would work as knowledge and knowledge reinforcement activities development of skills, as a form of work independent, so it was foreseen this possibility, necessary to achieve solidity of knowledge, but encouraging the students a space for the thought exploratory .

They took in consideration various ways to reveal contradictions for the creation of situations problematic. The most employees were the comparison of two elements that have similarities and differences; situations whose content this based in two opposing points of view , but both partially acceptable or truthful, which depend on their contrary corresponding and complementary mutually; situations based in the appreciation of phenomena and processes real , objective and observable, which appear have a cause other than the true one ; phenomena and/or processes that integrate objects of study of various sciences (astronomical, physical, chemical, geographical or biological), which lead to consequences unexpected for those who do not know his essence or its connections causal and in those that can be presented as consequences or causes, to create the situation problematic, then apparently They lack all logic ; contradictions based in cause- effect relationships, in which the cause may turn in effect and vice versa and contradictions that arise in two ways different to analyze the same object , phenomenon or process, in correspondence with dissimilar points of view. [17]

The work teaching-methodological had as result further the development of the guides is significant didactic- descriptive classes by Teaching Problem for three conferences and a class practice of Topic III Mycology Medical subject Microbiology and Parasitology Medical [19]

The collective assimilated experiences and new knowledge of one's own content and nature methodological.

An excerpt from Table 1 of contents and contradictions is presented below:

<i>Candida albicans</i>	En ocasiones una candidiasis se transforma en una candidemia, a pesar de que ambas entidades se deban a la misma especie de micótico. ¿Cómo se explica que se produzca esta transformación?
<i>Cryptococcus neoformans</i>	La Criptococosis es una micosis sistémica, generalmente, oportunista. Es producida por <i>Cryptococcus neoformans</i> , la mayoría de las veces. Generalmente en la población inmunocompetente no se genera el cuadro, y solo es en los inmunodeprimidos como los pacientes VIH positivos o los trasplantados donde aparece el cuadro. Sin embargo, las lesiones no son debidas al propio hongo, sino que son provocadas por la propia reacción inmune, fundamentalmente en los pulmones y en el cerebro. ¿Cómo se explica que las lesiones que son capaces hasta de producir la muerte, no se deban a la acción directa del hongo?

Fuente: Condensado de la tesis de Grado Científico titulada: Revalorización del proceso docente-educativo en Microbiología y Parasitología Médica mediante la estrategia “Enseñanza Problemática Integrada”

Tabla 1: Selección de algunas de las contradicciones identificadas en el contenido de enseñanza del tema III Micología Médica mediante el trabajo metodológico

Discussion

The work methodological systematic allows to reconcile the opinions of the members of the collective pedagogical of a subject , in addition to being a way to show the recent colleagues incorporation , some styles for directing effective he process teaching-educational , because in the bosom of this collective are discussed the topics are incorporated new approaches , it is disclosed information novel , about all in subjects in which they can be incorporated certain advances scientists , that the collective decides how they are going to be addressed , in that class , how , or can discuss the way to incorporate a methodology that exists been employee in others areas educational and identify their advantages and potential to bring them to the classroom . All this job has to attend to the beginning didactic and adjust to the guidelines contentious in Ministerial Resolution 2/18 Work Regulations Teaching Methodological. [20]

When the decision was made to introduce Teaching Problem in the subject Microbiology and Parasitology Doctor , the collective I was convinced that it had to be done transformations in the way of leading the process teaching-educational , because at the conferences I had to be employed he Exposure method Problematic , in the one in which the categories predominate situation problematic and problem teacher and this means that previously must determine the contradictions that are going to go away revealing in he during the conference , which modifies he content of the work methodological that is necessary carry out previously and influences in he the teacher 's working style , which, although it is an aspect of his job very personal, it is mediated by a condition of the Teaching Problem , which is to reveal contradictions to create situations problems or formulate the issues teachers directly , [21] since not all situation problematic becomes problem teacher , but all problem teaching creates a situation problematic , according to raises the theory .[22]

Other particularity occurs in the development of the conference, when in the moment propitious, each contradiction must be revealed (or the problem teaching formulated), after which has to take time for yourself students for their assimilation, so that, after this moment, in the very exhibition, the teacher will give you solution to the problem teacher, through explanation relevant. The professor has the power to develop an exposure problematic monologued or dialogued, although this last variant is preferable, because it gives participation to the students. [23]

In regarding the preparation of the guides didactic- descriptive classes by Teaching Problematic , in opinion of the authors , is decisive importance of writing this document methodological for each hour/ class , because has as function of guiding each one teacher , when conceiving his / her process management activities teaching-educational in any of the subjects , because , as his denomination indicates, responds to the characteristic of narrating in detail all the development of each hour / class conceived by Teaching Problematic already its function methodological this aimed at offering recommendations to the teachers who are going to use them so that they are used contradictions to create situations problematic , in order to unify not only he content , but also the way to develop it in the classes .[19]

The elaboration of these guides is decisive to reconcile two aspects contradictory presents: by a part, the personal nature of each lesson plan teacher and by another, the need to perform the check empirical class system by Teaching Problematic, so the lectures and the class practice in the sample groups they should be the most similar possible.

Other function that the guides would fulfill didactic- descriptive class by teaching problematic elaborated through the job methodological, was that of constituting a way to achieve he training of the teachers and the incorporation of modes of action in the direction of the process teaching-educational, when used this conception.

Therefore, the guides didactic-descriptive constituted descriptions of the development of each hour/ class of topic III of Mycology Medical by Teaching Problem, in which the foundation of the use of categories and the methods problematic suggested, recommendations for the teacher who interpreted them, could make any change relevant in nature methodological and the essence of the teaching content.

The work methodological was designed to differentiate the use of Learning Based in Problems, which in It is sometimes confused with the concept of Teaching Problem employee in this work, [10] as much as possible note by reading materials that review research carried out in Education Medical, which was evident in the bibliographic consultation directed to different research results educational, which does not detract merits to this methodology so widely used.

We're interesting the points of view held by the members of the collective in relationship with the possibility that Teaching has Problem of facilitating the integration of knowledge from others subjects, for which he was recognized his potential to achieve interdisciplinarity, as well such as the feasibility of including it in online courses or meetings where the Flipped Classroom or class is used inverted. It was also commented his integration in educational software, as well as others ways of presenting he knowledge, as long as they are believed situations problematic, conceptualized as he central link of Education Problematic.

According to experiences previous ones, the students also must adapt to This way of working with them, undoubtedly novel. However, throughout its employment in all classes in whatever it may be possible , given by the discovery of contradictions appropriate to the objective and content of each form of organization , the students they come to create a motivation for the search for new ones knowledge , which allows classes that initially they can become slow and long , a time after , the students exceed are first stages and it is done further agile that search thought , and equally It happens with the teachers , who reach a level desired skills teachers to take to their classes new elements of problematicity. [24].

It is worth noting how, from the very discussion of the members of the collective in preparation methodological, yes this It is well directed, there is an exchange very fruitful in the case of class development by Teaching Problematic, because they are proposed different ways of revealing contradictions and maintaining a careful analysis of the way in which the

issues teachers, since in this process must be taken presents the two poles of contradiction.

Conclusions

The activity methodological that was developed to organize the application of Teaching Problem in lectures and classes practices, from Topic III of Mycology Medical, of the subject Microbiology and Parasitology Doctor, she was based fundamentally in the study of the research results previous; in this case, a result accomplished in Primary Education with the subject of Natural Sciences and another investigation developed in the same center, in the subject of Embryology. These experiences were significant.

The work methodological gave way to discussions profitable and had results productive, having in account some contributions theoretical and practical from practice in the classrooms with this conception didactics, background that allowed elaborate guides didactic- descriptive classes by Teaching Problem for three conferences and a class practice, which remained as models for others teachers understand how they can apply the categories and methods of Teaching Problem in this subject and, in addition, he did possible he research process educational that would have to be developed by this same collective in successive courses schoolchildren.

All the process of introducing the categories and methods of teaching Problem in any subject, must be planned in the collective, so the job methodological becomes in a task essential

Declaration of conflict of interest

The authors of the article we declare that it does not exist conflict of interest and that motivates us to make known he researches development educational.

List of contributions of the Authors:

Rebeca Zayas was the lead author in conceptualizing the research methodology and writing the original draft.

Adania Guanache facilitated data curation from previous research, and reviewed the original draft.

Damasa Irene López Santa Cruz worked in the summary and dealt with the media audiovisuals necessary for the work development in the collective methodological and in job in the digital editing of the article.

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