

## Correlation among the criterion of the professor and the academic results in molecular biology

Abreu Ugarte JE<sup>1</sup>

Saldaña Bernabeu A<sup>1</sup>

Benavides Socarras OE<sup>1</sup>

Cruz García MA<sup>2</sup>

<sup>1</sup>Medical Sciences University of the Revolutionary Army Force. Havana. Cuba

<sup>2</sup>Medical Sciences University of the Havana. Cuba

### ABSTRACT

**Introduction:** The methodological work of the department of morfofisiología loans special attention to the quality of the educational process. One of the purposes is the suitable employment of the valued criterion of the professor like a focus of the efficiency of the process, that it is useful to his time also for the prediction of the educational results, in the individual and collective.

**Objective:** The present work studies the correlation of the valued criterion of the professor with the achievement of the aims of the subjects, expressed this last by the educational results obtained in the ordinary examination. It was studied its chronological behavior in the period of five years.

**Material and Methods:** A matrix of correlation was created. We determined the coefficient of Spearman. Some factors that could influence in its objectivity predict were also identified by the study.

**Results:** The review of the registers of methodological meetings, open classes and newspapers of classes allowed us to identify some factors that could act on the valued criterion of the professor. They can improve the objectivity of the correlation between this criterion and the academic achieving at the final examination in the subject of molecular biology in the students of first year on medicine career.

**Conclusions:** To attention and systematic monitory of the individual educational evolution and collective in the methodological work of the subject and in the department, attains to increase the efficiency of the valued criterion of the professor and its correlation with the ends academic results. The results constitute an educational innovation for the methodological work in the subjects that integrate the Biological Bases of the Medicine.

**Key words:** criterion, correlation, methodological work, molecular biology.

## INTRODUCTION

Among the purposes of the methodological work of the collective of subjects in molecular biology is to contribute to the improvement of the educational medical process and increase his quality. In this sense directs its actions to determine the factors that could restraint it and look for opportune solutions.

Carry the methodological work to the diverse fields of the educational activity is a need, therefore, between the tasks to fulfil this the one to employ properly the criterion of the professor like a parameter of the efficiency of the process and attain his fidelity for the prediction of the results of the subject.

We concede special attention to the systematic evaluations and to the pedagogical observation, because they support the criterion of the professor. By such reason, results necessary the promotion of systems of evaluation in which it require to be with objectivity in which measure, consequently attains the fulfillment of the aims in function to reach the learning developer of the students.

The molecular biology (BM) like science has developed in the last years and it has influenced in the progress of other scientific branches, in particular the biomedical. His object of study is the all the complex process of the life to molecular level, the structure, the properties and the functions of the essential biomolecules for the life, as well as his upper organization.

Like subject of the plan of studies of medicine, it is among which the student first course, creating him expectations and difficulties. The educational collective of BM tackles the improvement of the teaching to improve the results and ponders the criterion of the professor like an indicator of prediction of the results of the process of education learning, in the individual and collective. Besides it is of interest determine the factors that influence in his correspondence with the results and its objectivity like prognosis indicator.

The criterion of the professor, properly based, can offer objectivity elements for the systematic analysis of the course of the educational proses, pipe the methodological work and the didactic actions of the community of subject, with the purpose to correct the deficiencies in the education process. Besides, the analysis of his results makes possible to design the strategies for the work differentiated, as well as establish a prognosis of the final results.<sup>(1)</sup>

However, in the educational practice no always there is univocal correlation, what carries to the question in which measure is efficient the criterion of the professor like parameter of prediction of the educational development of the students and of the fulfillment of the aims? On the other hand, diverse causes no identified totally in his essence can take part in the problematic before exposed, generating other question: which factors may affect its fidelity? For the more: which actions might to implement to attenuate them?

The methodological work poses among its actions to increase the efficiency of the criterion of the professor and its correlation with the academic results, optimize its predictive function of the ends results and that these correspond with the main degree of possible certainty with the acquisition of knowledge and abilities by the students.<sup>(2)</sup>

The pedagogical investigation, component of the methodological scientific work, is the road used to solve the problem, posing like aims: increase the correlation of the criterion of the professor and the results of the subject and detect the factors that can affect his predictive objectivity.

#### Materials and Methods

Universe: educational results of the subject BM of students of medicine of first year. Sample: the corresponding to the courses comprised between the years 2013 and 2019. Criterion of exclusion: those that caused drop from the career by any reason. Design: it realized an observational and prospective study to double blind. Independent variable: criterion of the professor. Dependent variable: educational ends results in the subject BM on the ordinary examination.

The data was compiled in tables and the IBM SPSS 23 processed it. One matrix of correlation was done. It also determined for each course the coefficient of Spearman (one-sided), with a scale admitted by other authors.<sup>(3)</sup>

The documents that evidencing the methodological work of the subject BM were analyzed as well as the registers of assistance and the systematic evaluations of the students, taking references in other authors.<sup>(4)</sup>

## RESULTS

The quantity of included students in the study is of 700, the general data of the subject BM (table 1) show increase in indicators of educational result: percentage of approved, average and index of quality.

**Table 1.** Ending results in Molecular Biology in the courses studied

	Courses				
	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019
Examined student	152	133	153	140	122
% of promotion	91,44	92,48	94,7	97,9	98,4
Academic average	4,07	4,12	4,33	4,39	4,41
Quality index	0,89	0,91	0,93	0,95	0,96

The methodological work realized by the collective of subject BM, based in the systematic evaluations and the analysis of the criterion of the professor, improved progressively the correlation with the ending results, in the last course 77,82 %. When identifying the educational difficulties could pose with main objectivity the pedagogical actions and the strategies for the work differentiated.

A matrix of correlation was made (table 2) mating the data: criterion of the professor and ending result. There is correspondence in 66,18 %. The criterion of 4 was the highest with 36,46 %, gone on down the one of 5 with 20,06 % and the one of 3 with 8,64 %. In the students disapproved in the ordinary examination predominate the criterion of 3 with 04,69 %, whereas only in 01,02 % existed correspondence.

**Table 2.** Matrix of correlation among criterion of the professor and ending results

Criterion of the professor	Results of the ordinary examination.				
	5	4	3	2	%
5	20,06	07,43	02,93	00,00	30,42
4	05,57	36,46	08,49	00,89	51,41
3	00,00	02,79	08,64	04,69	16,12
2	00,00	00,15	00,88	01,02	02,05
%	25,63	46,83	20,94	06,60	100,00

The coefficient of correlation of Spearman determined for each course and his tendency in the period of five years showed progressive increase (figure 2), achieving the rank of moderate, that is significant and one evidence of the effect of the pedagogical actions implemented by the educational product of the methodological work developed in the BM subject.

## DISCUSSION

The systematic evaluation and the assessment of his results involves to issue an assessment on the attainments and the deficiencies of the students in the process of teaching - learning, as well as his efficiency, what \*predicted the academic performance and is useful his systematic analysis.<sup>(5)</sup>

The results of the study offer a proposal to improve the correlation of the criterion of the professor like parameter of prediction of the educational performance, in function to direct the pedagogical actions and act on the problems cognitive of the students. They take references of his importance in the diagnostic of students with risk of failure.<sup>(6)</sup>

The collective reasoning of the criterion of the professor, including the absences, was not methodical. These have like consequence that the student does not receive the class. In occasions awarded the final note of the subject without taking into account other functions of the evaluation, sample of pedagogical empiricism. The community established the criterion of the professor like essential part of the evaluation of the student that includes appearances instructive and educational, like formative function. Some investigations remark this appearance like essential referent in the work differentiated headed to improve the educational process.<sup>(7)</sup>

Besides it results insufficient the employment of the systematic evaluation like road that make possible to identify the difficulties of the students. The community determined to consider the intellectual development of the students like a priority, as it establishes the contemporary education, contextualized with the advances of the science and the technician. To this direction have to drive the efforts and the strategies of the educational process, to the training of reflexive students and creators.<sup>(8)</sup>

They employed little the technicians and instruments for evaluation that make possible to the students his assessment of responsible way, essential appearance for the quality in the final results. By his intimate relation with the academic performance, pedagogical investigations centre his interest in the subject, essentially in the ways of learning, the emotional intelligence and the evaluation of the development of the cognitive ability.<sup>(9)</sup>

Another appearance is the little use of the systematic evaluation to stimulate the understanding of complex contents and of main difficulty for the students. It oriented work in the motivation by his influence in the learning. The professor has to motivate when giving the contents, adapt the methods and the means to employ in the instruction. In accordance with other authors, the opinion of the educational about the capacities to learn of his students is essential to determine the convenient didactic actions to the contents to concretize the educational intentionality of the subject.<sup>(10)</sup>

The innovative way to take advantage of the criterion of the professor proposes like form to orient the activity of the educational and of the students in the formative context, as well as for the management of the resources of learning oriented to structure the differentiated work in profit of the education, defining put to attain according to the capacities of the student, as they suggest the results of works of other authors.

The criterion of the professor offers a vision of the effectiveness and quality of the teaching learning process. Beside other pertinent factors of the practice, like the "effect group", allows evaluating the effect of the didactic actions, the activity of professor and knowing the difference between the level of entrance and of exit of the students. Besides it orients the educational interventions, the suitable use of motivational strategies and of learning in a subject transcendent for the instruction and education of the medical professionals.

## CONCLUSIONS

The pedagogical actions increased the correspondence of the criterion of the professor and the final results of the subject showing his effectiveness. They determined factors that with incidence negatively in his predictive objectivity and implemented actions that reduced his effects, increasing the objectivity predicts for the final results. The experience presented is an innovative proposal for the methodological educational work and for the differentiated attention to the students.

## BIBLIOGRAPHIC REFERENCES

1. Valle Castañeda W, Castillo Estrella T, Camejo Puentes M. La evaluación del aprendizaje del concepto a la acción. Revista Mendive [Internet]. 2018 [citado 04/03/2019]; 16(2): 222-37. Disponible en: <http://mendive.upr.edu.cu/index.php/mendiveupr/article/view/1327>
2. Rodríguez Fontes R, Díaz Rodríguez PA, Moreno Lazo M, Bacallao Gallestey J. Capacidad predictiva de varios indicadores de selección para el ingreso a la carrera de medicina. Educ Med Super [Internet]. 2000 [citado 06/03/2019]; 14(2): 128-135. Disponible en: [http://scieloprueba.sld.cu/scielo.php?script=sci\\_arttext&pid=S0864-21412000000200002&lng=es](http://scieloprueba.sld.cu/scielo.php?script=sci_arttext&pid=S0864-21412000000200002&lng=es)
3. Martínez Ortega RM, Tuya Pendás LC, Martínez Ortega M, Pérez Abreu A, Cánovas AM. El coeficiente de correlación de los rangos de Spearman caracterización. Rev Haban Cienc Méd [Internet]. 2009 [citado 08/03/2019]; 8(2): [aprox. 1 p.]. Disponible en: <http://scielo.sld.cu/scielo.php?script=sciarttext&pid=S1729-519X2009000200017&lng=es>
4. Cañizares Luna O, Sarasa Muñoz NL, Pérez de Armas AM. Modelo para los análisis de promoción. Educ Med Super [Internet]. 2016 [citado 14/04/2019]; 30(2): [aprox. 2 p.]. Disponible en: <http://www.ems.sld.cu/index.php/ems/article/view/786>
5. Gómez-López VM, Rosales-Gracia S, Marín-Solórzano G, García-Galaviz JL, Guzmán-Acuña J. Correlación entre el examen de selección y el rendimiento académico al término de la carrera de Medicina. Educación Médica Superior [Internet]. 2012 [citado 04/04/2019]; 26(4): [aprox. 2 p.]. Disponible en: <http://www.ems.sld.cu/index.php/ems/article/view/75>
6. Ruiz G, Ruiz J, Ruiz E. Indicador global de rendimiento. Revista Iberoamericana de Educación [Internet]. 2010 [citado 07/03/2019]; 52(4): [aprox. 2 p.]. Disponible en: <http://www.rieoei.org/3258.htm>
7. Gómez-López VM, Rosales-Gracia S, Marín-Solórzano G, García-Galaviz JL, Guzmán-Acuña J. Correlación entre el examen de selección y el rendimiento académico al término de la carrera de Medicina. Educ Med Super [Internet]. 2012 [citado 11/03/2019]; 26(4): 502-513. Disponible

en: [http://scieloprueba.sld.cu/scielo.php?script=sci\\_arttext&pid=S0864-21412012000400003&lng=es](http://scieloprueba.sld.cu/scielo.php?script=sci_arttext&pid=S0864-21412012000400003&lng=es).

8. Prado Junco VL, Piñeiro Barreiro M, Romero Ortega V. Inteligencia y motivación como aspectos fundamentales en la formación de estudiantes en la carrera de Medicina. *Educ Med Super* [Internet]. 2014 [citado 11/03/2019]; 28(3): 416-423. Disponible en: [http://scieloprueba.sld.cu/scielo.php?script=sci\\_arttext&pid=S0864-2141201400030003&lng=es](http://scieloprueba.sld.cu/scielo.php?script=sci_arttext&pid=S0864-2141201400030003&lng=es).

9. Abreu Ugarte JE, Saldaña Bernabéu A, Pérez López O. Desarrollo de habilidades cognoscitivas en las ciencias biomédicas. *Acta Microscópica* [Internet]. 2017 [citado 02/03/2019]; 26(A): 642-643. Disponible en: <http://www.ciasem2017.sld.cu/index.php/CIASSEM/2017/schedConf/presentations>

10. Hernández Rodríguez Y, Cruz Menor E, Bacallao Gallestey J, Guerra Paredes M, Linares Hernández L. Capacidad predictiva de algunos indicadores en el rendimiento docente de la asignatura Fisiología Médica. *Educ Med Super* [Internet]. 2008 [citado 07/06/2018]; 22(3): 1-11. Disponible en: [http://scielo.sld.cu/scielo.php?script=sci\\_arttext&pid=S0864-21412008000300002&lng=es](http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-21412008000300002&lng=es).

Dr. C Jorge Eduardo Abreu Ugarte. Medical Sciences University of the Revolutionary Army Force. 114 entre 25 y 31. Marianao. La Habana. Cuba. e-mail: [jabreu@infomed.sld.cu](mailto:jabreu@infomed.sld.cu)