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Didactic strategies used in the Master Lecturers and subgroups classes and their impact on the academic performance of the students of the subject Introduction to Physics, given by teachers of the Department of Physics of the Faculty of Education and Languages, during the second semester 2014

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ABSTRACT

A study was conducted on the basis of the results from two reports about the evaluation of master lectures led by the Direction Academic[1] of UNAN-Managua in 2011, where it was reflected: the lack of coordination between subgroup teachers and teachers who taught the master lectures, and students' non-attendance. Based on the above issues and being the course of Introduction to Physical not included in the first evaluation, it arises the necessity to make a detailed analysis in order to know the behavior of development of Master Lectures and subgroup lessons to get the necessary inputs that allow improving the approach of the same ones. It is a descriptive, analytical and correlational research, according the time of occurrence of the facts and registration of data the study is prospective and related to the study is transversal. There were interviewed one hundred eighty nine students from the first years of careers such as Geography, Anthropologic Social, Communication to the development, physiotherapy and Optometric Medical, who attended to the Master Lecture IF1-02, likewise observations were made on the development of the master conferences, interviews with teachers and students and focus groups. It was founded that the teachers who taught the Masters Lecture used a traditional methodology; the subgroup lessons were more participative. Another important aspect to mention is that the students from the careers who attended less to the master lectures got the best scores at the end the courses; it was obtained an intrinsic relation between the factors of teacher and performance.

INTRODUCTION

Introduction to Physics is a subject that belongs to the area of General Training that, with the implementation of Curricular Transformation initiated in 2011, was incorporated in some careers

1. From the year 2015 changed to Teaching Direction of Degree

of the National Autonomous University of Nicaragua, Managua, which began the programs of the curriculum 2013 and is taught in the first or second semester of the first year of the career. The Master Conferences come as an educational strategy, to respond to the growing increase of new students and the demands to guarantee quality in the teaching-learning process (UNAN-Managua, 2011, p.1). In this sense, the Academic Direction of UNAN-Managua, carried out an Evaluation of the Development of the Master Conferences and Subgroup Classes in the I and II Semester of 2011. In these two reports a series of results that deserve special attention are highlighted.

The 2011 first semester report shows the lack of coordination between the teacher who teaches the Master lecturers and the teacher of the subgroup. This was manifested by teachers and students; In addition, students' absences to the Master Conferences are very notorious (UNAN - Managua, 2011, pp. 38 and 39). The second semester report 2011 shows that 35% of the students affirm that their participation in the development of the Master Conferences was not active; 41% of students say that Master's Conferences should be more dynamic, in which students have a greater role; 8% believe that Master Lectures are boring (UNAN-Managua, 2012, pp. 19 and 20).

Based on these results and since the Master Conferences and Subgroup Classes of the course of Introduction to Physics have not been evaluated, the need arises to carry out a detailed analysis, in order to know the behavior of the development of the Master Conferences and Subgroup classes and thus obtain necessary inputs to improve their approach. It is for this reason that it is sought to investigate the didactic strategies used in the development of the Master Conferences and Subgroups classes and how they affect the academic students' performance of the Introduction to Physics subject.

Several investigations have carried out an approach of didactic strategies implemented in the development of the Master Conferences. There are authors who do so from the perspective of the usefulness of these conferences and proposal for a participatory learning (Alterio and Pérez, 2004). In this same issue, Baños and Farré (2011) and González and Colombo (2006) In which he proposes the implementation of didactic strategies aimed at dynamizing the approach of lectures. These researchers use the students' opinions to make these didactic proposals. Tarabay Yuñes and Salazar (2004) present a relevant analysis of the role of argumentation during the development of the Master Lectures, emphasizing that the rhetoric used by the teacher in the motivation of the students for the conference.

This demonstrates that the learning process is conditioned by the teaching model that prevails in the classroom, where the teacher and student act, from the transmission of knowledge through exposure by the teacher and the student as a simple receiver (García Pérez, 2004) where the construction of knowledge is strengthened by the student in his interaction with the environment that surrounds him (Carretero, 1997), being the teacher a guide and Mediator between what the student knows and the new to learn (Ruiz Ortega, 2007), being the student the main element of the learning processes. This is why, in order to respond to the demands demanded by today's globalized society, the National Autonomous University of Nicaragua, Managua, adopts an educational model that places first the learning needs of students, in which a series of guidelines and didactic strategies that allow the teacher to be a guide and enhance the development of students´s kills that enable them to perform adequately throughout their academic life and later in their field of work.

In order to achieve the above mentioned, the teacher must implement adequate strategies that lead students to the development of new skills and abilities that allow them to perform properly in this society where Science and technology play an important role in the daily life and, it is in the school where the students must be prepared so that they are able to face the challenges currently demanded by the globalized society. The teaching work in the classroom requires a meticulous planning process, in which the didactic strategies are the teacher´s tools to get students appropriate the contents in an effective way. and therefore the learnings are significant.

From this point of view, in the subjects of general formation, particularly Introduction to Physics, the Master's Conferences were implemented as a necessity to favor the learning processes, in order that the approach of the contents were directed to the improvement of the Learning in these subjects, in which the teacher in charge of teaching must master the content to be taught. Authors such as Rodríguez Sánchez (2011), Baños and Farre (2011) and Isaza Restrepo (2005) agree that lectures are ineffective because of the passivity of students and an there is an overvaluation of the teaching role which is seen as a source of knowledge for the student, little follow-up of learning, among others.

If a careful analysis is made of each of these approaches, the deficiency is not of the method as such, but of the use and activities that are implemented during the development of the Master Conferences. These disadvantages can be minimized by adequate planning and execution of the conferences, integrating activities that motivate student participation. In accordance with the above mentioned, Fernández (2005, quoted by Rodríguez Sánchez, 2011) points out that a master class must be well prepared, well structured, possess expository clarity, seek the involvement of the audience, be carried out with interest and enthusiasm, make use of the appropriate communicative and corporal expression skills (p 89). Also Videla (2010) points out that the lectures have attributes that significantly affect the students' attitudes, stating the following "[...] it is attributed a formative and motivating value from the teacher who dictates the class [...] [...] can favor multiple forms of social interaction, considering the moments before and after them ... "(p 188).

The afore mentioned indicates that, there is an incidence of the Master Conferences in the development of social skills among the students that attend to them ; Sharing opinions favors the acquisition of knowledge, development of the ability to synthesise, interest in developing a general culture of knowledge beyond the specialty they study, establishing the relationship of the subject that is taught and their career. Of course, if proper planning of the lectures is not carried out, they will not be effective and will not fulfill the objective for which they were implemented with the Curricular Transformation initiated in 2011.

MATERIALS Y METHODS

By the research method the present study is observational; According to the purpose of the methodological design the type of study is descriptive (Piura, 2006). According to the classification of Hernández, Fernández and Baptista (2006), the type of study is Correlational. According to the time of occurrence of the facts and registration of the information, the study is prospective and according to the period and sequence of the study is transversal. According to the scope of the results, the study is analytical (Canales, Alvarado and Pineda, 2008).

As for the philosophical approach, through the use of the instruments of data collection, analysis

and data linkage, the present research promotes the systemic integration of qualitative and quantitative methods and techniques, therefore, a mixed approach is implemented (Pedroza 2016).

The universe of this investigation was constituted by the first entry students who took the Introduction to Physics Course, at UNAN-Managua. The population was all the students of the careers that attended to the Master Conferences that were taught by the teachers of the Department of Physics of the Department of Education and Languages. A non-probabilistic, decision-type sample was performed (Munch Galindo, 1996), because the sample should be selected from the number of lectures that were assigned to the Department of Physics of the Department of Education and Languages by the Academic Direction of the UNAN-Managua, during the II Semester of 2014; That is why, Master conference IF1-02 was selected, integrated by the degrees of Geography, Social Anthropology, Communication for Development, Optometry and Physiotherapy, that were taught in the Reading Room of the Library "Salomón de la Selva".

DISCUSSION AND RESULTS

The main strategies used in the approach of the contents to be given in the lectures, from the perspective of students, teachers and researcher were: situations of daily life as an incentive to attract students attention, concept maps, illustrations, graphics and videos, as shown in Figure 1. *(See Figure 1 on next page)*

Each of these strategies were used at each stage of the teaching process. The situations of daily life were used as pre-instructional strategies that allowed to know the previous ideas of the students around the subject matter of study; Conceptual maps, graphs and illustrations, were more oriented to the moment of structuring knowledge, that is to say, constructional and the videos served as a postinstructional strategy, because they allowed to consolidate what has been approached in the lecture. This is in agreement with Diaz and Hernández (2002) in their classification of didactic strategies according to the moments of the didactic sequence in the classroom.

The lectures of Introduction to Physics subject were mainly focused on the teacher's action, in which strategies that allowed interaction with the students, seminars and debates were never used, because they were not contemplated in the planning of the conferences.This fact was verified through the observations. Pineda (2003) points out that these strategies allow an exchange of ideas between the students and the teacher, they improve the didactic communication, because the activity is focused on the development of new skills and abilities, information search, reflection Criticism around content that is addressed at the conference, and others. In this sense, Baños and Farre (2011) and Rodríguez Sánchez (2011) express that if the strategies used are not chosen according to the students needs passivity, monotonous and boring environment is encouraged, as was observed during the development of the lectures.

In relation to the main didactic strategies used in the discussion of the contents in the Subgroups classes were: graphs, analogies, daily life situations, problem solving, investigations, tutorials, comprehension questions, and seminars, as shown in Figure 2, which shows that the strategies used were more oriented to interaction with students, according to the moments of the teaching-learning process. *(See Figure 2 on next page)*

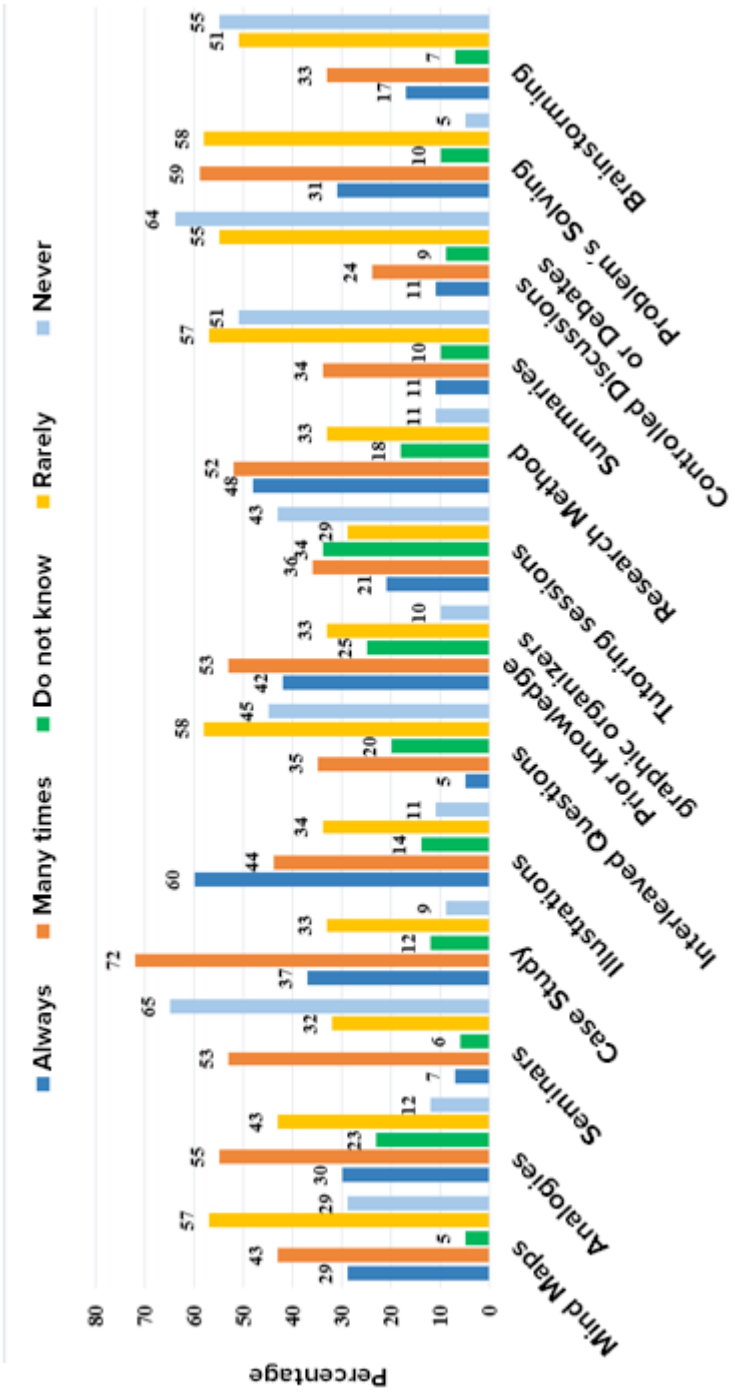

Figure 1: Didactic strategies used in the development of master conferences

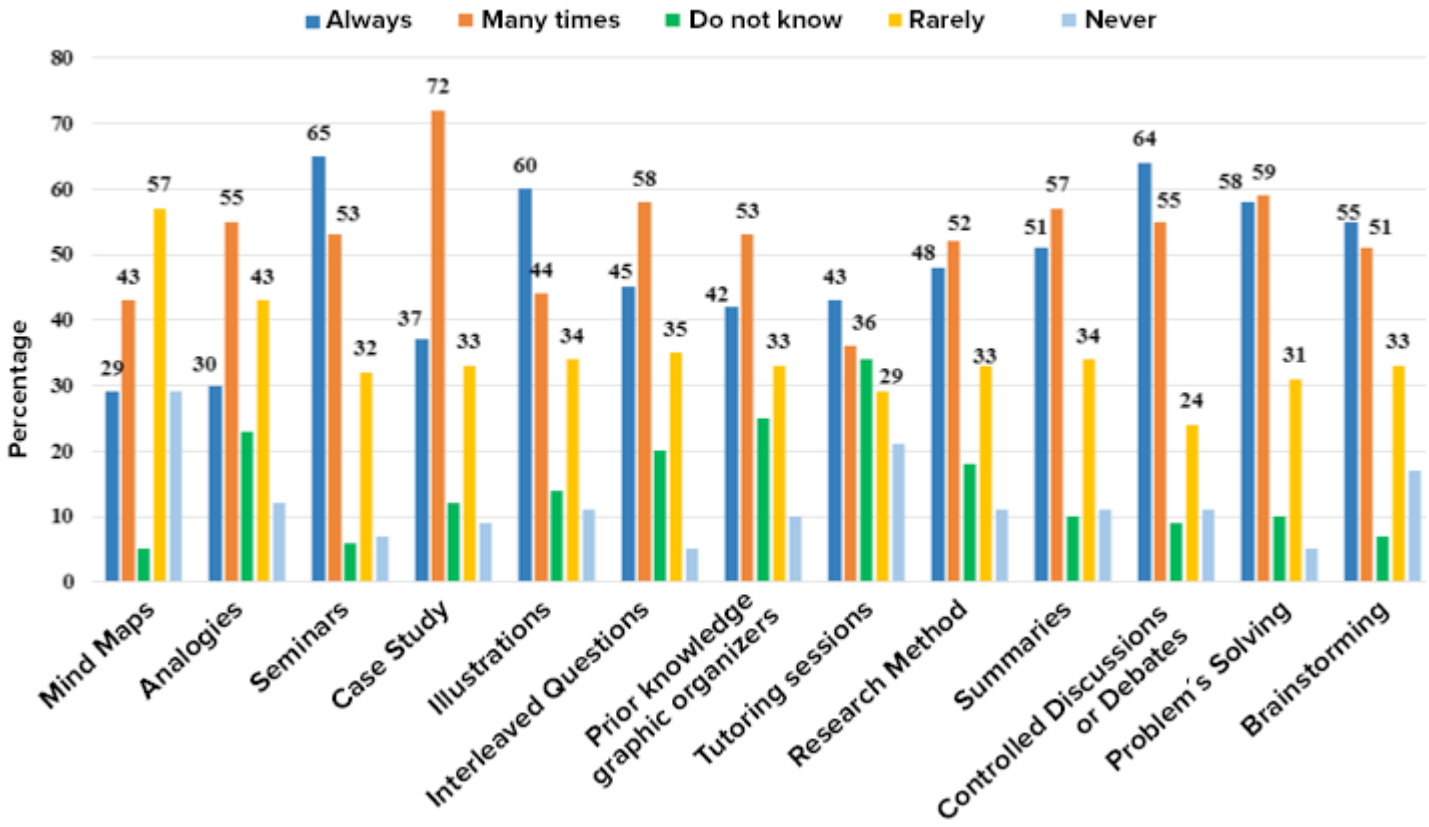

Figure 2: Didactic strategies used in the development of subgroups classes

Diaz and Hernández (2002) in their classification indicate that daily life situations, analogies and comprehension questions or questions, are used as a pre-instructional strategy; seminars, debates and graphs, can be used as co-construction strategies; and the laboratory practices, as a complement to reinforce the strategies of structuring knowledge; In addition, research as a teaching strategy allows students to develop skills and abilities that contribute to reinforce their learning, as they access different sources of information that allow enriching discussion activities in the classroom (Camacho, Casilla and Finol de Franco, 2008).

In relation to the teacher pedagogical activity, the students indicate that teachers possessed scientific mastery, adequate tone of voice, contextualized contents and that incited them to the curiosity to learn, which is one of the aspects indicated by Tarabay Yunes and Salazar (2004) and Rodríguez Sánchez (2011) as necessary elements in communication and teaching discourse.

Another aspect that was evidenced throughout the development of the Master Conferences was that most of the time they were expositive conference, in which the contents were explained through the slides, without allowing the interaction with students, the students acted as simple recipients of the information provided to them at the conference, this in accordance with what Parra Pineda (2003), Rodríguez Sánchez (2011) and Baños y Farré (2011) stated, being these elements the evidence of a traditional conference.

The above demonstrates that the lectures of Introduction to Physics subject were traditional because the teacher was the main element and the student a receiver, without any role; In this

sense, the teachers point out that the lectures were not effective. Since the conception of lectures as a teaching method clearly specified in the Educational Model of the UNAN-Managua is not the difficulty, but is related to the use of the method and activities that were implemented during their execution. Firstly, it is necessary to implement learning activities mediated through didactic strategies that encourage the participation of students guided by the teacher; Secondly, the management of these strategies comes into play by the teacher who has the ability to maximize the qualities of these strategies to achieve the integration of all students.

Likewise, the relationship between pedagogical action and student attitude is emphasized, If a teacher gives a boring lecture, in which he or she is the only one who speaks and the student listens, negative effects will arise from the development of lectures thus most of the students do not pay attention to what the teacher explained. This is corroborated by the statistical test ***(p=0.040, p=0.000, p=0.05, p=0.030, p=0.038)***, that evidenced that there is an association between dependence between teacher performance and performance of students during lectures. This shows that there is a high degree of dependence between the way the teacher gives the Master Conference and the active participation of the students.

Regarding the incidence of the pedagogical activity of the teachers who taught the subgroup classes, it was verified that the students showed a high degree of acceptance, since all activities were always focused on the student, in which they were asked to present their ideas, to participate constantly in the seminars and debates, to carry out laboratory practices that contrasted the theory with the practice ,the role of the teacher in this case was to guide and to clarify the doubts of the students. The afore mentioned is in agreement with López Noguero (2007), De la Cruz (2004) and Rodríguez Sánchez (2011), who say that all classes should be participatory, in which students develop skills and abilities that contribute to the achievement of meaningful learning.

Regarding the academic performance of Introduction to Physics course, there was a high percentage of approved students, reflecting something very interesting in relation to the attendance of the students of each one of the careers to the Master Conferences and Subgroup classes. It was evidenced that the careers in which the students had the least amount of attendances to the Master Conferences obtained the best grades at the end of the course (see Figure 3 and Figure 4 *on next page*).

The career of Medical Optometry and Social Anthropology, unlike the careers that had the greatest number of attendances to Master conferences , their academic performance ranged from Deficient (60-69) and Regular (70-79), with few students achieving a High performance in these careers , which coincides with the analysis of the Principal Components (see Figure 5 *on next page*).

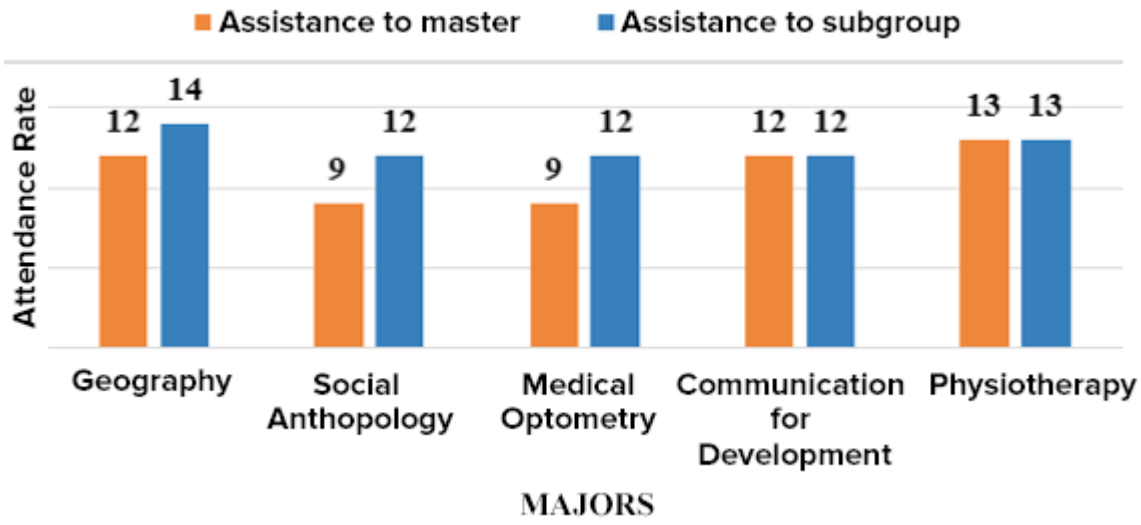

Figure 3: Academic performance for careers

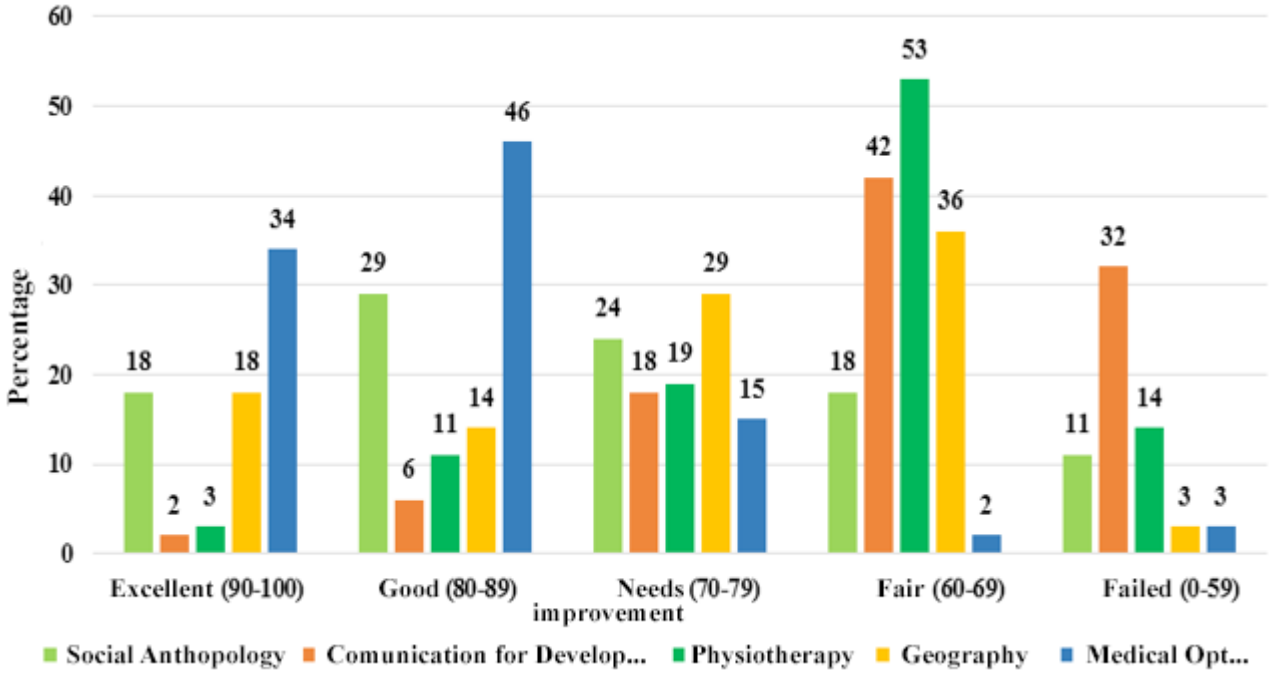

Figure 4: Attendance to Master conferences and subgroups classes

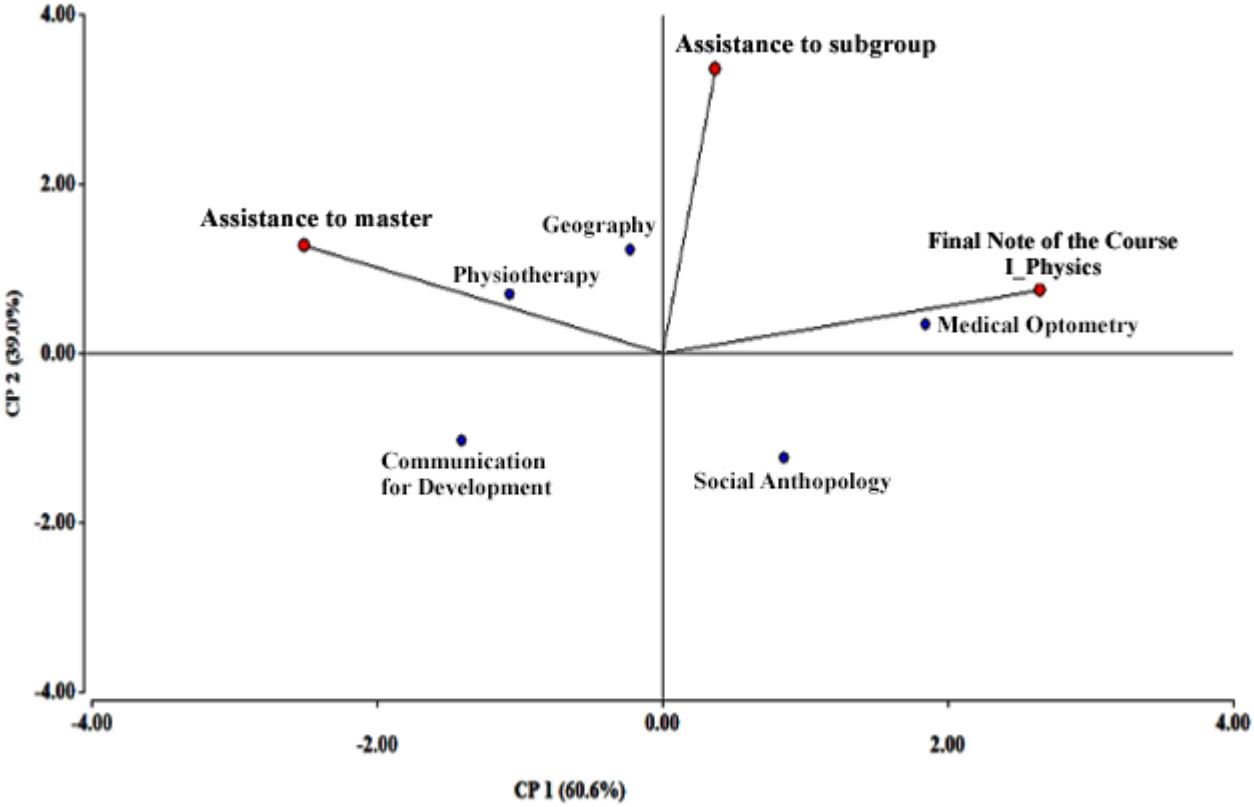

Figure 5. Biplot Graph obtained from Principal Component Analysis, where the relationship between each of the variables Attendance to Master, Attendance to Subgroup and Final Score

This is corroborated by the analysis of variance using the LSD Fisher test, being significant ***(p=0.0002; p=0.0013; p=0.0137; p=0.0115; p=0.0182)***, where a high degree of relationship between the categories of Attendance to Master conferences and the Final grade of the Course, that for each one of the careers different groups were established, emphasizing that the students who had the most attendance at the conferences obtained the highest score in each one of the careers.

CONCLUSIONS

The didactic strategies used during the development of the IF-02 Master Conference of the Introduction to Physics course were in line with each of the moments of the teaching-learning process, in which they were more oriented to the transmission of knowledge on the part of the teacher without being able to incorporate the students in activities that allowed the interaction during their execution. However, during the development of the subgroups, the didactic strategies were student-oriented, since active participation was encouraged through a participative methodology, achieving a high degree of acceptance on the part of the students.

Adequate management of teaching strategies in which the teacher played a key role in the execution of the Master Conferences, due to implementing a strategy by itself has no effect on students, but it comes into play the mediating role of the teacher to make these strategies effective

in the learning process and therefore to make Master Conferences more participatory.

The overall academic performance of students attending the IF1- 02 Master's Conference was acceptable, as the scores of most students ranged from excellent to regular, with very few students failing. It was also evidenced that the careers that least attended the Master's Conferences obtained the best academic performance, where as the careers that have the greatest number of attendances to subgroups were the students who obtained the lowest scores and the greatest number of failures; which is corroborated by the Principal Component Analysis that defined a close relationship between attendance at Subgroups and Attendance to Master conferences with academic performance. Based on the above, it is evident that, not attending or constantly attending the Master Conferences is not decisive to obtain a good academic performance in the subject of Introduction to Physics.

REFERENCES

Alterio Ariola, G. H, y Pérez Loyo, H. A (2004). *Utilidad de las Clases Teóricas Magistrales y Propuesta para un aprendizaje participativo. Educación Médica Superior, 18(2).* Retreived from: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-21412004000200008

Baños, J, y Farré, M (2011). *Dinamización de la clase magistral en medicina:diez ejemplos de minicasos utilizados en la docencia de la Farmacología.Educación Médica Superior,* 14(2). Retreived from: http://scielo.isciii.es/pdf/edu/v14n2/original1.pdf

Camacho, H., Casilla, D. y Finol de Franco, M. (2008). L*a Indagación: Una Estrategia Innovadora para el Aprendizaje de Procesos de Investigación.Laurus,* 14(26). Retreived from: http://www.redalyc.org/pdf/761/76111491014.pdf

Canales, F. H. D., Alvarado, E. L. D. y Pineda, E. B. (1994). *Metodología de la Investigación: Manual para el desarrollo de personal de salud.* Organización Panamericana de la Salud. PALTEX.

Carretero, M. (1997). *¿Qué es el constructivismo?. Progreso.* Retreived from: http://www.educando.edu.do/Userfiles/P0001/File/Que_es_el_constructivismo.pdf

De la Cruz, M. A. (2004). *Un modelo de lección magistral para un aprendizaje activo y cooperativo.Universidad Central del Este.* Retreived from: http://www.uce.edu.do/uce_virtual/Aulas_virtuales/Tecnologia_EducativaII/elibrary/1-%20Materiales%20Complementarios%20del%20Modulo%20Pedagogia%20Universitaria/LeccionMagistralA

Díaz, F. y Hernández, G. (2002). *Estrategias Docentes Para un Aprendizaje Significativo, una interpretación Contructivista.* (2da ed.). México: McGrawHill.

García Pérez, F. (2000). *Los modelos didácticos como instrumento de análisis y de intervención en la realidad educativa. Bibliográfica de Geografía y Ciencias Sociales.* Retreived from: http://www.ub.edu/geocrit/b3w-207.htm

González de Galindo, S. y Colombo de Cudmani, L. (2006). E*strategia didáctica en clases multitudinarias de matemática: opiniones de los alumnos.Educación,* 30(2). Retreived from: http://www.redalyc.org/articulo.oa?id=44030208

Hernández, R., Fernández, C. y Baptista, P. (2012). *Metodología de la investigación* (5ta. ed.). México: McGraw - Hill.

Isaza Restrepo, A (2005). *Clases Magistrales versus actividades participativas en el pregrado de medicina. De la teoría a la evidencia.Estudios Sociales.* Retreived from: http://www.redalyc.org/articulo.oa?id=81502006

López Noguero, F. (2007). *Metodología Participativa en la Enseñanza Universitaria* (2da ed.). Madrid, España: Narcea, S.A. de Ediciones.

Parra Pineda, D. M. (2003). *Manual de Estrategias de Enseñanza – Aprendizaje .Circulos de Estudios Pedagógicos y de la Formación Profesional.* Retreived from: http://www.cepefsena.org/documentos/METODOLOGIAS%20ACTIVAS.pdf

Piura, J. (2012). *Metodología de la investigación científica: Un enfoque integrador.* (7a. ed). Managua.

Rodríguez Sánchez, M. (2011). *Metodologías Docentes en el EEES: de la Clase Magistral al Portafolio. Tendencias Pedagógicas,* 17. Retreived from: http://www.tendenciaspedagogicas.com/Doc/N_17.pdf#page=85

Ruiz Ortega, F. J. (2007). *Modelos Didácticos para le enseñanza de las Ciencias Sociales.Latinoamerica de Estudios Educativos.* Retreived from: http://site.ebrary.com/lib/pruebademo/docDetail.action?docID=10353099

Tarabay Yunes, F. y Salazar, A. L. (2004). *La Argumentación en la Clase Magistral. Teoría y Didáctica de las Ciencias Sociales,* 9. Retreived from: http://www.redalyc.org/articulo.oa?id=65200903

Videla, R. L. (2010). *Clases pasivas, clases activas y clases virtuales. ¿Transmitir o construir conocimientos? Educación Médica.* 74(2). Retreived from: http://www.scielo.org.ar/pdf/rar/v74n2/v74n2a11.pdf

Universidad Nacional Autónoma de Nicaragua, Managua. (2011a). *Evaluación de las Conferencias Magistrales en la UNAN-Managua. I Semestre académico 2011.* Managua, Nicaragua. Dirección Académica. Autor

Universidad Nacional Autónoma de Nicaragua, Managua. (2012). *Evaluación de las Conferencias Magistrales en la UNAN-Managua. II Semestre Académico 2011.* Managua, Nicaragua. Dirección Académica. Autor