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# Evaluation of a Peer Mentoring Program by Mentees After Staying Three Years at the University

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**Abstract**— Though *Peer Mentoring* is often cited as among the most influential factors on retention rates and degree completion, that influence is difficult to assess. From the academic year 2007-2008, the evaluation of the Mentoring Program of the *Escuela Técnica Superior de Ingenieros de Telecomunicación* (PM-ETSIT) at the *University of Las Palmas de Gran Canaria* (ULPGC), which is currently in its seventh year of operation, involves as a differential factor a complementary evaluation based on specific satisfaction surveys completed by *Mentees* after staying three years at the University. In this paper, the results obtained from the appraisal of the influence of the PM-ETSIT in different aspects of the student's academic life, including their decision to remain at the University, are presented.

**Keywords**- engineering education; engineering student retention; peer mentoring

## I. INTRODUCTION

The challenges for someone transitioning from High School to University can be significant. These challenges translate into a need for increased student support during the transition to University to improve retention, particularly when the student is entering into engineering with the number of students declining. Research into the factors that impact persistence is crucial for institutions to develop appropriate policies and practices to enhance retention.

In this sense, universities have expressed concern about the retention of first-year students, since the first year shapes subsequent persistence, and the largest proportion of leaving occurs in the first year. Critical components of successful first-year programs include academic orientation, support programs, tutoring, first-year seminars, skills development programs, and mentoring programs. As a consequence, some universities have developed programs for first-year students that included intensive orientation, advising, or mentoring. In particular, results from several studies on mentoring in higher education [1] support the value of successful *Peer Mentoring* programs in assisting first-year students during their transition to University in order to minimize the attrition rates that are typically high at engineering degrees. Mentoring at the University level generally refers to a process of continuum assistance and guidance to first-year students through experienced students within the same discipline [2]. This process of peer mentoring is based on the unique qualification and motivation of

experienced students to help first-year students, and their best learn in an atmosphere of friendship and stimulus. The benefits of peer mentoring programs in University are both personal and professional, offering the satisfaction of helping peers and increasing the confidence of experienced students.

The Mentoring Program of the *Escuela Técnica Superior de Ingenieros de Telecomunicación* (PM-ETSIT) at the *University of Las Palmas de Gran Canaria* (ULPGC) is intended to establish a mechanism based on peer mentoring provided by upper-class students (*Mentors*) to provide help, support, and resources to incoming first-year students (*Mentees*) by developing basic skills and attitudes throughout their first semester at the ULPGC on a range of academic, social and administrative issues, under the supervision of *Teaching Tutors*, that otherwise would have acquired slowly and with more difficulty. *Teaching Tutors* and *Mentors* report to the *Coordinator*, who has oversight of the program and is responsible for the assessment, holding the training and weekly *Mentor* meetings, ...

The ETSIT Mentoring Program has been in existence since the academic year 2004-2005. For the academic year 2006-2007, a review based on feedback from the participants in the first two editions of PM-ETSIT was introduced to its actual form. In this sense, the main improvements consisted of generating materials to support *Mentors* in their labor over *Mentees*; improving the training of *Teaching Tutors* and *Mentors*; defining a structure and relatively formal program timed to provide the right information and support at the right time –including the content of weekly mentoring sessions, an outline of the topics that should be covered during the program of meeting sessions, and the week in which they must be addressed–; as well as involving *Teaching Tutors* in the development of the ETSIT Mentoring Program, and establishing an Intranet web-based portal as a supporting tool for *Teaching Tutors* and *Mentors*.

## II. THE ETSIT MENTORING PROGRAM

The ETSIT Mentoring Program runs from June until March of the following year, mainly coinciding with the first-semester of the academic year. During this period, PM-ETSIT is developed from the coordinated achievement of the following processes [3]:

- Organizational structure and initial planning.
- Recruiting and selection of *Teaching Tutors* and *Mentors*.
- Training of *Teaching Tutors* and *Mentors*.
- *Initial coordination meeting*.
- Recruiting of *Mentees*.
- *Welcoming session*.
- Weekly mentoring sessions.
- Monthly coordination sessions.

A technical committee coordinates the implementation of the different activities comprising the ETSIT Mentoring Program, meeting at least two times throughout the duration of the program in order to select *Teaching Tutors* and *Mentors*, ... The recruitment and selection of *Teaching Tutors* and *Mentors* commence at the end of the previous academic year. Potential *Mentors* are contacted by publishing announcements on notice-boards, and by sending a mass email to students in later years of the degree. Potential *Teaching Tutors* are contacted by email. Training at PM-ETSIT addresses issues related with the facilitation or conduct of the mentoring sessions, and others related to the content of the mentoring program. In this sense, *Mentors* have training in generic interpersonal communication skills, identifying the strategies that might be used for making their initial contact with their *Mentees*, for setting up the first meeting, and for running the first mentoring session. The content of weekly mentoring sessions is agreed from *Coordinator*, *Teaching Tutors* and *Mentors* during an *initial coordination session* held before recruiting of *Mentees* and the start of the mentoring meetings. This *initial coordination meeting* focuses on the content of the mentoring program, including the material, an identifying specific strategies and suggestive activities that might be used for each of the topics or areas of material. Recruiting of *Mentees* is based on a flyer distributed during an announcement in a lecture in the first week of the course, ensuring that students are contacted early and in time for mentoring to begin from the second week of class. The purpose of the *welcoming session* is mainly to ensure that any student interested in being a *Mentee* is fully informed about PM-ETSIT, and to mark off the start of the mentoring program for participants. Each weekly session there are certain topics that *Mentors* will discuss with their *Mentees*, according to the planning agreed during the *initial coordination meeting*. *Mentees* complete three forms during the weekly sessions regarding previous knowledge of the degree and the motivation of the first year students for its election, their adaptation to the University, and the subjects covered on the first semester. During the second part of the first semester, topics cover some visits to research laboratories in order to improve *Mentees* attendance to weekly sessions. Finally, the last meeting is held after the exams. In addition to weekly mentoring sessions, *Mentors* meet monthly to share experiences. Also, in order to involve *Teaching Tutors* with the *Mentor* and *Mentees* weekly sessions, they are recommended to assist to some specific planned meetings covering critical topics for the first-year students, allowing closer links with lecturers and supporting *Mentors*. After each meeting with

their *Mentees*, *Mentors* elaborate a report of the session and send it to the *Coordinator* and their *Teaching Tutor*. Once fulfilled, *Mentors* upload each report using the web-based portal. Reports are available for the *Coordinator* and the *Teaching Tutors*, being one of the mechanisms for controlling the activity of *Mentors*.

### III. PM-ETSIT OUTCOME EVALUATION DESIGN

The evaluation process is a crucial part of any peer mentoring program as it provides information to address any weakness, demonstrate that it is complying established goals and objectives, and increase its effectiveness through a feedback/continuous quality improvement procedure. Though peer mentoring is often cited as among the most influential factors on retention rate, that influence is difficult to evaluate [4].

To determine the effectiveness of a peer mentoring program, regardless the evaluation design adopted [5], it is necessary to select the appropriate instruments to measure outcomes from multiple sources of information, being the most used the satisfaction surveys –including, in general, a fixed set of possible answers to choose from– since they are simple to prepare, and do not require a lot of time. However, satisfaction surveys should be considered as just one instrument of an overall evaluation process to determine the effectiveness of a peer mentoring program, and its contents should be based on common questionnaires whose validity has been demonstrated.

In this sense, evaluations of mentoring programs tend to exclusively assess *Mentees* satisfaction with a *Mentor*, with very few studies examining the impact of mentoring programs on *outcomes* [6]. Outcome evaluation of the ETSIT Mentoring Program is based on a *single-group* design with *post test*, since all first-year students are invited to participate as potential *Mentees*. The outcomes are mainly measured using a set of measurable indicators –including retention rate as a method of measuring retention of first-year students– and anonymous satisfaction surveys completed by *Teaching Tutors*, *Mentors* and *Mentees* after the fall meeting. These satisfaction surveys were elaborated within a mentoring network which includes most of the universities developing mentoring programs in Spain, including ULPGC [7]. The creation of this network has allowed the obtainment of relevant data, combining efforts and skills, finding synergies, and studying, analyzing and developing a more rigorous form of evaluating peer mentoring programs.

### IV. PM-ETSIT EVALUATION BY MENTEES AFTER STAYING THREE YEARS AT THE UNIVERSITY

Some of the issues covered through the implementation of the ETSIT Mentoring Program are not directly used by *Mentees* during their first semester at the University, and in many cases, the incoming first-year students don't have an adequate temporal perspective to value all the aspects in which the mentoring program have influence. For this reason, from the academic year 2007-2008, the PM-ETSIT involves, as a novelty, anonymous specific satisfaction surveys completed by *Mentees* after staying three years at the ULPGC in order to evaluate its influence on their decision to remain in engineering

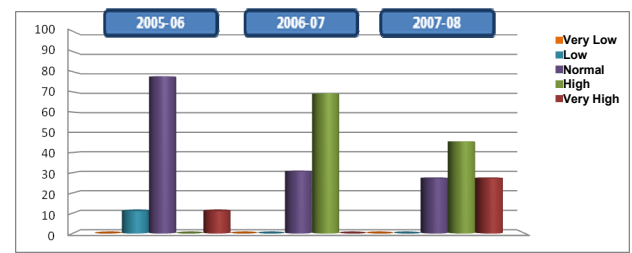
and at the University, and their perception about the effectiveness of the mentoring program in different issues like study habits, knowledge of the degree, relationship with other students, or usefulness of the topics covered during the weekly mentoring sessions, among others. This paper focuses on the results obtained from satisfaction surveys completed by students who participated as *Mentees* in the academic years 2005-2006, 2006-2007 and 2007-2008, after staying three years at the University. The surveys were distributed through a web form at the end of the first semester of each academic year. Regarding the participation rate, from the 45 students participating as *Mentees* in the academic year 2005-2006, a 57.5% of them completed the satisfaction surveys, while this rate was 51.3% and 69.2% for the 43 and 31 students who participated as *Mentees* in the academic years 2006-2007 and 2007-2008, respectively.

The satisfaction surveys elaborated to evaluate the ETSIT Mentoring Program by *Mentees* after staying three years at the University were structured into seven items: *Personal Benefits*; *General Benefits*; *Development of PM-ETSIT*; *Influence of PM-ETSIT on the academic activity*; *Continuation of PM-ETSIT*; *Mentors Evaluation*; and *General Appraisal of PM-ETSIT*. Results obtained for each item are shown in following sections, establishing the satisfaction degree on a scale of five values: *Very Low*, *Low*, *Normal*, *High* and *Very High*. To understand the evolution of some of the results appearing in the evaluation by *Mentees* after staying three years at ULPGC, improvements introduced in the ETSIT Mentoring Program from the academic year 2006-2007 will be referred. In addition, a comparison of the satisfaction degree of *Mentees* at the end of their participation in the PM-ETSIT, that is, in their first year, with that obtained from satisfaction surveys completed after staying three years at the University, will be included.

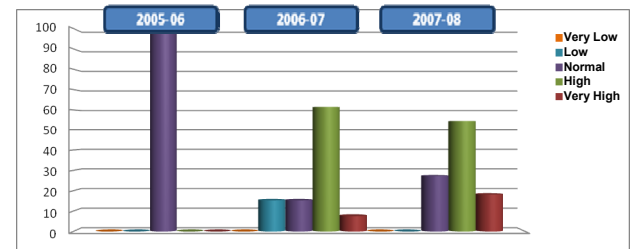
#### A. Personal Benefits

The *Personal Benefits* item from the surveys includes aspects related to the satisfaction of students with their participation in the ETSIT Mentoring Program, the usefulness of the topics covered during the weekly mentoring sessions, and its influence on their social integration into the ULPGC and their academic life. As illustrated in Figure 1a), the satisfaction degree of students with their participation in PM-ETSIT has evolved from a *Normal* level to a *High-Very High* level, corresponding these results with those obtained at the end of their participation in the PM-ETSIT, based on which the percentage of *Mentees* with a *High* and *Very High* level of satisfaction was 71% and 88% for the academic years 2006-2007 and 2007-2008, respectively. This progression shows how the behavior of a peer mentoring program should be dynamic. After its launch, it must conform to the expectations of participants involved in its development, including *Teaching Tutors*, *Mentors* and *Mentees*. A significant reference of this evolution is the information related to the topics to be covered on the weekly mentoring sessions of the ETSIT Mentoring Program. Initially, this information was considered to be excessive and disordered. At present, it is available on an Intranet web-based portal, being classified by topics and structured for each one of the weekly mentoring sessions to be held between *Mentors* and *Mentees*. This fact, as stated in

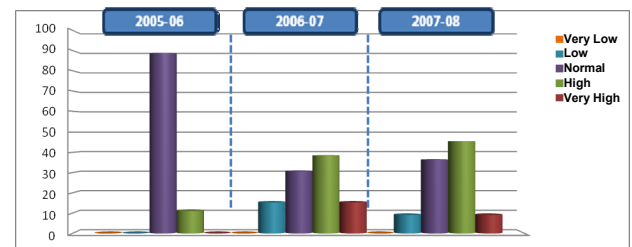
Figure 1b), has improved the satisfaction level of students from *Normal* to *High-Very High*.



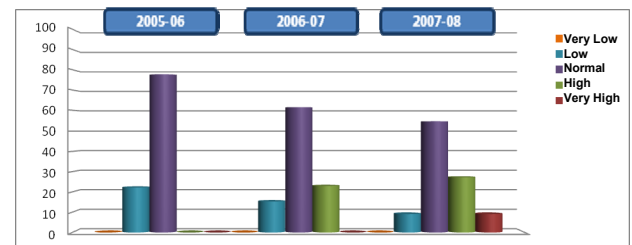
a) Degree of Satisfaction with your participation in PM-ETSIT



b) Usefulness of the information provided on the weekly sessions



c) Positive influence of PM-ETSIT in your adaptation to university



d) Positive influence of PM-ETSIT in your education

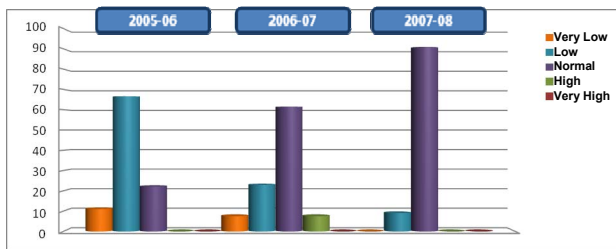
Figure 1. Personal Benefits.

In relation to the influence of PM-ETSIT on their social integration into the University, over 50% of students rated as *High-Very high* their level of satisfaction, as reflected in Figure 1c). Figure 1d) shows, with a similar trend, the influence of PM-ETSIT in their education. In this respect, the obtained results at the end of their participation in the ETSIT Mentoring Program as *Mentees*, show a better evaluation of the influence of PM-ETSIT in their education, with a *High* level of satisfaction of 58% and 63% for the academic years 2006-2007 and 2007-2008, respectively. A relevant point in the evolution of this item can be related to the improvements introduced on the training of *Mentors* from the academic year 2006-2007.

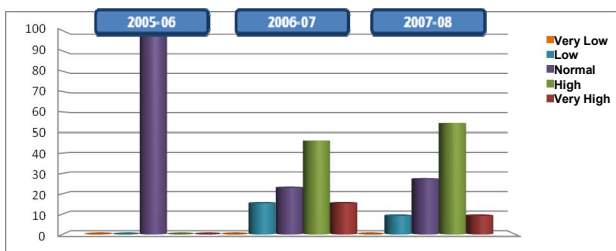
### B. General Benefits

One of the main objectives of the ETSIT Mentoring Program is related to academic guidance. The influence of the PM-ETSIT in this item is generally perceived by students as *Low*, standing at the academic year 2007-2008 in a *Normal* level for almost 90% of respondents, as shown in Figure 2a). Note that this influence is less valued by *Mentees* after staying three years at the University, as illustrated by the fact that satisfaction level was *Normal* for a 56% of the students in their first year.

The curriculum of the Telecommunication Engineering degree at the ULPGC, although does not include recognized specialties, has three main areas of knowledge. The choice of an area of knowledge is realized only through the selection of electives related to it. However, there is no impediment in the choice of electives, so a student can choose their optional subjects attending to any other criteria. In general, a consistent academic background includes the choice of electives related to one particular area of knowledge. The results of Figure 2b) shows that over 60% of the students considered as *High* the influence of the ETSIT Mentoring Program in their orientation, corresponding these results with those obtained at the end of their participation in the PM-ETSIT, in which the degree of satisfaction was *High-Very High* on this item for 67% and 72% of respondents in the academic years 2006-2007 and 2007-2008, respectively. The evolution of this indicator can be understood bearing in mind that this is one of the items that are included in the documentation provided to *Mentees* and, in turn, has been formalized in the training of *Mentors*.



a) Positive influence of PM-ETSIT on your academic results



b) Positive influence of PM-ETSIT on your academic orientation

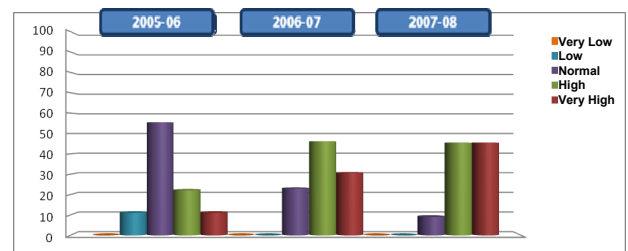
Figure 2. General Benefits.

### C. Development of PM-ETSIT

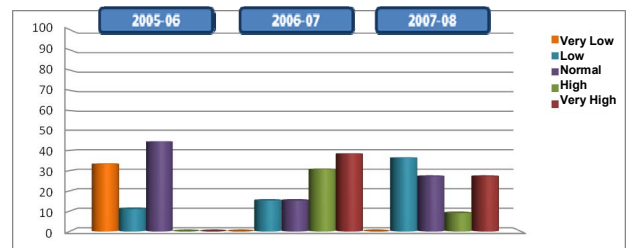
A common feature of the degrees related to engineering is their general character for the first academic year. In this sense, first-year students have to take very general courses, far from those finalists subjects closely related to the professional

attributions of the degree. In this sense, some weekly mentoring sessions of the ETSIT Mentoring Program include visits to research laboratories to help providing a more practical view of the degree. In this regard, the satisfaction level is *Very High* for a 90% of students, as is shown in Figure 3a). This positive evolution of the satisfaction level in this issue, which in its inception was predominantly *Normal*, has been achieved by modifying the purpose of the visits. This approach has evolved from a mere exhibition of different equipments and laboratory facilities, to a practical presentation of research projects being developed in laboratories.

One of the most complex points in the development of the ETSIT Mentoring Program has been the role of the *Teaching Tutors* in its organizational structure. Initially, *Teaching Tutors* were in charge of supporting *Mentors* in their mentoring labor, but with no clearly defined role, and most importantly, concrete duties. This fact has been modified from the academic year 2006-2007, now having the *Teaching Tutors* a well defined duty in the development of PM-ETSIT, such as assists to some of the weekly mentoring sessions and reports the progress of *Mentors*. This fact has been reflected in the evaluation process, as stated in Figure 3b). However, the analysis of this item shows the need to advance in the role of the *Teaching Tutors* in the ETSIT Mentoring Program.



a) Interest of visits to research laboratories



b) Appraisal of the presence of Teaching Tutors in weekly sessions

Figure 3. Development of PM-ETSIT.

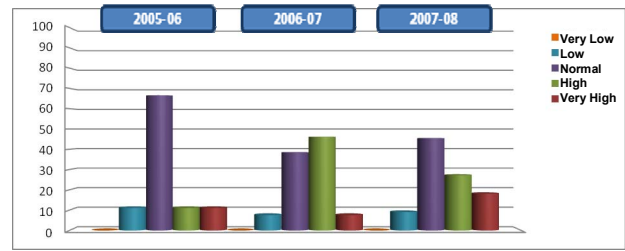
### D. Influence of PM-ETSIT on the academic activity

Increasing attendance to tutorial hours was one of the main academic objectives to be achieved by the ETSIT Mentoring Program, since it has been demonstrated that first-year students have an initial hesitation to consult their professors. In this regard, 80% of the students recognize a positive influence of their participation in the PM-ETSIT on attendance to tutorial hours, as shown in Figure 4a).

Another academic item tried to be addressed in the ETSIT Mentoring Program is the guidance of first-year students in

adequate methodologies of study and time management. In this sense, training of Mentors has been based primarily on their personal experience. For this reasons, and according to the results reflected in Figure 4b), it seems advisable to include this topic in the training of *Mentors*.

Two of the aspects considered as very positive to increase first-year students' academic performance are the class attendance and the submission to exams. This consideration is strengthened by the facts that, on the one hand, the subjects that include a percentage of continuous assessment are increasingly and, on the other hand, there is no book that can completely overcome the explanation of a professor. Regarding class attendance, Figure 4c) shows that 45% of students considered that the influence of PM-ETSIT was *High-Very High*, compared to 50% which considered it as *Normal*. Finally, one of the factors that influence a first-year student submitting to exams is the previous experience of students from other courses. However, PM-ETSIT seeks to demonstrate to the students –both *Mentors* and *Mentees*– that they cannot take the experience of other students, but their own. In this regard, 45% of students considered that PM-STSIT positively influence on their submission to exams.

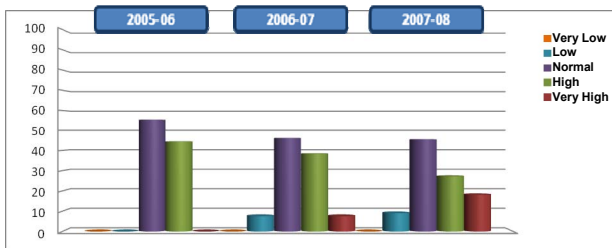


d) Positive influence in your submission to exams

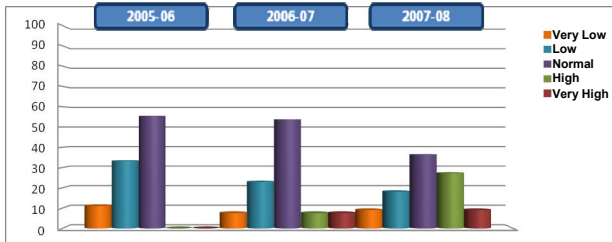
Figure 4. Influence of PM-ETSIT on the academic activity.

#### E. Continuation of PM-ETSIT

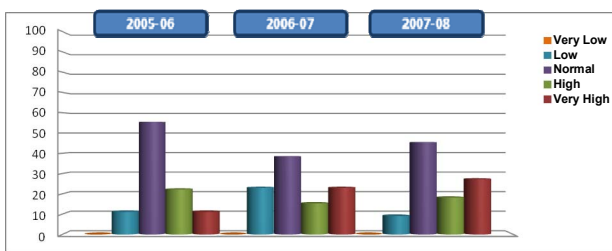
Regardless of the degree of satisfaction with their participation in the ETSIT Mentoring Program, students were asked to rate its continuation in subsequent years. The validity of this item can be verified by analyzing the satisfaction level of students with their participation in the PM-ETSIT. The consistency between the results shown in Figure 5a) and those reflected in Figure 1a), with a central axis located on the *High-Very High* level, reinforces the validity of these results. Furthermore, these data corresponds to those obtained at the end of their participation in the ETSIT Mentoring Program, being the satisfaction level *High-Very High* on this item for 83% and 89% of *Mentees* participating in the academic year 2006-2007 and 2007-2008, respectively. Within this ambit, the assessment about of willingness to participate as *Mentor* in the PM-ETSIT, reported in Figure 5b), shows a positive trend that runs from a *Normal* provision for those participating as *Mentees* in the academic year 2005-2006, to a *High-Very High* provision for the last two academic years. This evolution is consistent with the improvements introduced in the ETSIT Mentoring Program from the academic year 2006-2007.



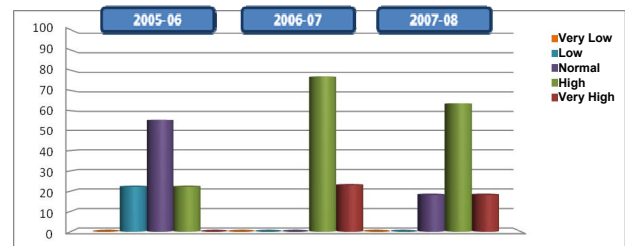
a) Positive influence to attend tutorial hours



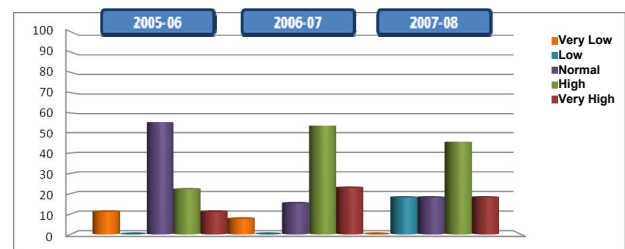
b) Positive influence on the better management of your time and study



c) Positive influence to attend class



a) Necessity of PM-ETSIT



b) Willingness to participate in PM-ETSIT as Mentor

Figure 5. Continuation of PM-ETSIT

### F. General appraisal of PM-ETSIT

Figure 6a) shows the evaluation of *Mentees* satisfaction with their *Mentors*. This assessment has clearly been influenced by improvements introduced in the ETSIT Mentoring Program from the academic year 2006-2007. Compared to a 66% of *Normal* satisfaction level for students participating in the academic year 2005-2006, more than 70% of students who participated in the following editions consider that their *Mentors* performed their duties with a *High-Very High* satisfaction level. These results corresponds to the ones obtained at the end of their participation in the PM-ETSIT, which was *High-Very High* on this item for 92% and 87% of students participating as *Mentees* in the academic years 2006-2007 and 2007-2008, respectively. This improvement in the assessment coincides with the review on the training of *Mentors*. On the other hand, Figure 6b) shows the degree of relationship of students with their *Mentors* after staying three years at the University, which in the academic year 2007-2008 was *High-Very High* for more than 80% of students.

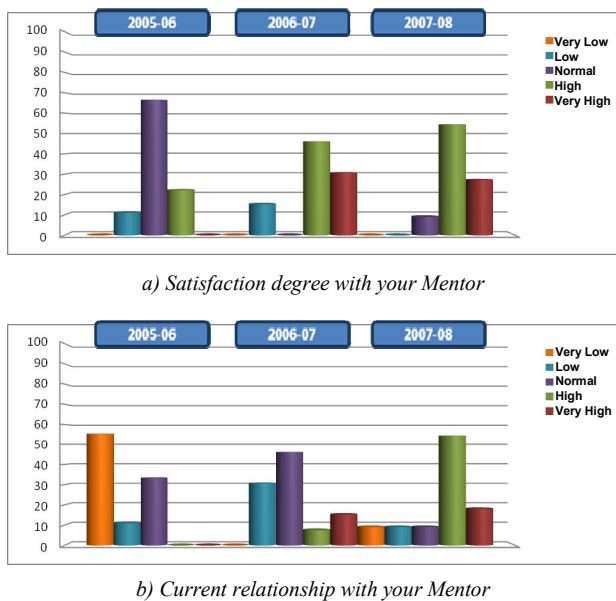


Figure 6. General appraisal of PM-ETSIT.

### G. Overall Evaluation of PM-ETSIT

Finally, students provided a general assessment of the ETSIT Mentoring Program. In this regard, as shown in Figure 7, the overall evaluation of PM-ETSIT has grown from *Normal*, for a 100% of *Mentees* in the academic year 2005-2006, to *High-Very High* for more than 80% of students participating in the two subsequent academic years.

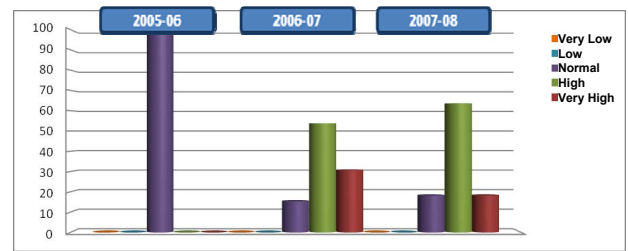


Figure 7. Overall evaluation of PM-ETSIT.

### V. CONCLUSIONS

The evaluation of a peer mentoring program is seen as critical issue in its approach, as it determines to what extent the established objectives are met, and it can increase its effectiveness through a process of continuous improvement. In this sense, as some of the issues covered through the implementation of a peer mentoring program are not directly used by *Mentees* during their first semester at the University, and in many cases the incoming first-year students don't have an adequate temporal perspective to value all the aspects in which it has influence, it was considered relevant to perform a complementary evaluation of the ETSIT Mentoring Program by *Mentees* after staying a certain period at the ULPGC. Based on the results presented in this paper, the information obtained can complement in many ways those obtained from other procedures, providing an assessment of the PM-ETSIT from a time perspective and experience of the *Mentees*. For this reason, it is considered to be a useful instrument in the evaluation process of a comprehensive peer mentoring program.

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