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Motivation and performance of students of an engineering program in the realization of industrial practices

R I Laguado¹, E G Florez² and F Y Hernández¹

¹ Grupo de Investigación en Innovación y gestión Productiva, Universidad Francisco de Paula Santander, San José de Cúcuta, Colombia

² Grupo de Investigación en Ingeniería Mecánica, Universidad de Pamplona, Pamplona, Colombia

E-mail: raquelirenelr@ufps.edu.co

Abstract. Industrial internships become the first approach to working life for students in their last semester and the first approach to develop the skills learned during their professional training. The Industrial Engineering program of the Francisco de Paula Santander University monitors the performance of the industrial practices and the motivation reflected by the students in the company where they carry out the practices. The article shows the results in the development of industrial practices, in terms of student motivation and performance in the tasks assigned in the company, highlighting the strengthening of professional development of students of industrial engineering.

1. Introduction

The Industrial practice is a subject of the tenth semester of Industrial Engineering of the University Francisco de Paula Santander (UFPS), which aims to develop skills through real experience in a business environment, the student assumes functions and develops projects that are related to areas of performance of the industrial engineer.

In this way, the development of industrial practices becomes the student's first approach to the work environment, in which young people actively participate in solving problems of a business nature. To this end, the industrial engineering curriculum begins with a stage of awareness from the semester prior to the completion of the practice and details the academic process in which the student will be immersed. The young people come to the days with expectations and motivated to do their semester of practice and learn business.

In the development of the practice, different observations and follow-up are carried out to determine the success and performance of the industrial practice, within this follow-up are the stages of sensitization, presentation of the students before the companies, formal registration of the industrial practice, formalization of the agreement of practices or learning contract, affiliation to the system of labor risks, assignment of a teacher of practices, assignment by the company of a tutor who carries out follow-up in the company, presentation of a work proposal to initiate the project of practices, presentation of the work plan, presentation of progress reports and final report, business evaluation, self-evaluation of the practice developed, self-evaluation of the practice, presentation of the work plan, presentation of progress reports and final report, business evaluation, self-evaluation of the practice developed, formal registration of the industrial practice, formalization of the internship agreement or learning contract. These stages become part of the process that the student carries out with the support



and monitoring of the teacher of practices and curriculum, which lead at the end of the academic semester to evaluate the results obtained in the industrial practice.

The results of the work of the industrial engineering students have been well valued by the businessmen [1], and it is important to know how the businessman perceives the motivation of the student in his work performance during the internship semester, for which the period between 2012-2016 is taken, and the analysis of the resolution of business problems by the student is carried out.

2. Principal theories

Industrial practices allow students in training a first approach to the work environment, this activity becomes a cooperation [1], important interaction between university-company, where students develop an applied work that benefits the organization.

The work done by the students generates personal satisfaction and benefits the company, they learn and strengthen good practices of teamwork, management of a good organizational climate for the development of activities [2], an effective link that gives meaning to the social and professional reality faced by students in training [3], which allows an enriching experience providing business value for the work done, in addition to observing the criteria for evaluating competencies in the process of developing the practices [3], for [4], the practices strengthen the University-business relationship, [5], highlights the main benefits for organizations in their processes.

For [6] it is important to teach from real scenarios, for which industrial practices are developed in real scenarios, where students develop their skills and abilities from reality. Thus [7,8,9] indicate that work performance does not depend only on professional training, it also depends on personal motivation to do things well. The participation of students in training in companies is an important mechanism in the university-industry relationship [10-12] and it is important to know what students perceive in the realization of industrial practices.

This study analyzes the link that has been established between the university and companies in the region and the country, is of utmost importance and knowing how businessmen perceive the motivation of students to carry out the assigned activities becomes a reference point for studies in order to establish a special follow-up that allows improvement actions to be established in the particular or individual cases that are required.

3. Methodology

The methodology used to carry out this study was based on the collection of the questionnaires applied semester by semester to the different business tutors, according to the practices carried out by the students, for the 2012-2016 period.

From the instrument applied in the companies during the final phase of the industrial practice, those questions related to the perception of the entrepreneur on the motivation and valuation of the assigned activities are taken. For the period 2012-2016, 369 complete questionnaires are obtained, to be processed and subsequently to carry out the analysis.

4. Results and discussion

For the present study, 5 questions are selected that are directly related to the entrepreneur's perception of the student's motivation to develop activities that provide solutions to business problems.

The business perception is very positive in terms of the motivation reflected by the student in the development of their practices, 84% of entrepreneurs or heads of area within the organization, value the interest and / or motivation of students as very good and 16% value it as good, this indicates that in general terms, that the motivation towards the development of activities is very positive (Figure 1).

The heads of area or businessmen value the handling of the work relations of the students of industrial engineering who develop their practices as very good in 72% and 27% as good, which indicates that the perception is very positive, and it seemed the good attitude and cooperation in the assigned activities in addition to the interpersonal relations and capacity of team work (Figure 2).

Employers value 78% as very good attendance and punctuality of the student in the development of industrial practices, 21% as good, which deserves a general assessment as very positive, while bearing in mind that 1% although not very representative value this appreciation as regular, which indicates that

it should be generated as a strategy to achieve total success in this assessment awareness of this aspect, given that it is also valued within the motivation of the student to arrive very punctually to the development of their activities (Figure 3).

It is observed that the businessmen value in a very positive way the fulfillment of the objectives raised by the company, 80% value as good the achievement of the objectives and 20% as good, which reflects that the proposed objectives are fulfilled in a high degree demonstrating that the students are motivated to fulfill the assigned tasks (Figure 4).

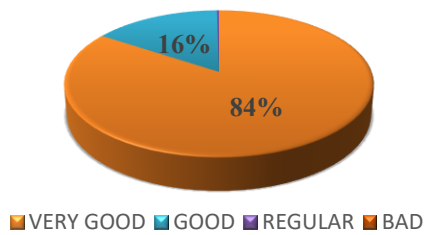


Figure 1. This figure presents the results of the question: How do you rate the interest and/or motivation shown by the student during the time of their internship?

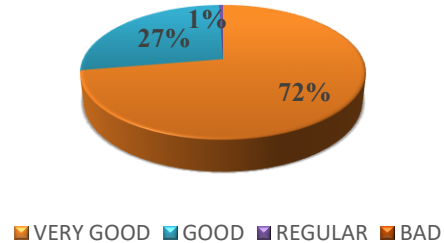


Figure 2. This figure presents the results of the question: How do you rate the management of working relationships with your superiors and with the staff with whom the student interacts?

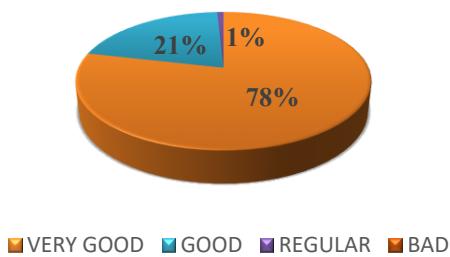


Figure 3. This figure presents the results of the question: How do you rate student attendance and punctuality during this practice?

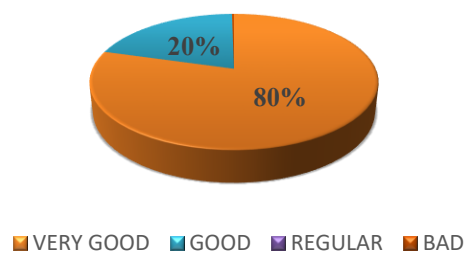


Figure 4. This figure presents the results of the question: Did the student in general meet the objectives set by the company?

The company considers the preparation of the student to be important. From the industrial engineering program of the UFPS a route of orientation has been traced that allows the strengthening of the relation university - company, in turn, of the preparation to face the managerial problems. 77% value the preparation as very good and 23% as good, which indicates that 100% recognize in a very positive way the preparation of the student when he comes to develop his industrial practices (Figure 5).

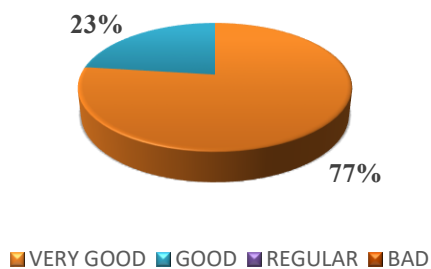


Figure 5. This figure presents the results of the question: What concept does the preparation of the UFPS Industrial student deserve?

On the other hand, within the instrument a quantitative assessment is carried out by the business tutor. For this study, we highlight the component of adaptation to company standards, which is made up

of factors such as attendance, punctuality, responsibility, compliance with industrial safety standards, compliance with the company's general standards and the general motivation for carrying out the assigned activities. On a scale of 0.0-5.0 the tutors give a quantitative value of 4.8 to this component. The above highlights good practices of adaptation to business standards by students and a strong motivation to do a great job in developing their industrial practices (Figure 6).

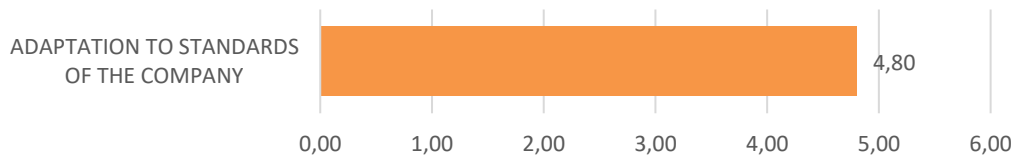


Figure 6. This figure presents the results of the question: Quantitative assessment of the company's adaptation to standards component for the period 2012-2016.

5. Conclusions

The industrial practices are the first approach to the working life of the students of industrial engineering of the UFPS, in this experience different aspects are valued. Among which motivation is the central theme of study and highlights a positive assessment by the company where they develop industrial practices.

The motivation shown by the student during the development of their industrial internship is perceived by employers as very positive, this assessment shows that the accompaniment during the semester of internship allows the student to maintain a great sense for doing things well and keep in mind that it is the first letter of introduction in working life.

The interpersonal relations of the students of industrial practices are very in agreement with the team work that the industrial engineers face in formation and that later in the working life they consolidate with a commitment of high responsibility. Entrepreneurs value interpersonal relationships as very good at 72% and 27% as good, this reflects a very positive valuation and although 1% is valued as regular, it is important for the UFPS industrial engineering curriculum to work in workshops on the importance of interpersonal relationships in working life.

Attendance and punctuality become factors highly valued by companies and demonstrate a sense of belonging and great responsibility for the duties acquired. Industrial practices are the first experience within a working environment, therefore, analyzing the valuation of employers against these factors is of great importance, since it demonstrates a training oriented to business valuation with responsibility. 99% of employers value as very positive the attendance and punctuality of internship students, and only 1% value as regulating this factor. It is important to emphasize that achieving the objectives proposed by the students in the work placement must be given in a comprehensive manner and achieve with great responsibility the tasks entrusted.

The fulfillment of the objectives raised by the students in the development of the industrial practice work is valued in 80% as very good and in 20% as good work, the preparation is perceived in 77% as very good and in 23% as good, these two factors go in agreement and demonstrates the motivation and responsibility of the students of industrial engineering of the UPFS as young people committed to contribute in the resolution of business problems of regional, national or international order if this way the possibility is given to develop their industrial practices.

As for the quantitative assessment of adaptation to company standards, carried out by company tutors, on a scale of 0.0 to 5.0 is rated with 4.8 which demonstrates the high sense of motivation and responsibility of students of industrial engineering internship at the UPFS.

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