IMPROVEMENT THE TEACHING-LEARNING PROCESS OF A UNIVERSITY SUBJECT BASED ON THE OPINION OF THE STUDENTS

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Abstract

The final objective of the research presented in this paper is to make a proposal in order to improve the teaching-learning process of a university subject, specifically the subject named “Integrated Information Systems in Industrial Companies” that is taught in the degree of industrial organization engineering.

This research is proposed because it has been observed that the students of the degree do not give too much importance to the subject of Integrated Information Systems in Industrial Companies. They have the perception that the contents are something alien to them, closer to the IT professionals, which is outside their work environment and has no direct application in the possible performance of their future work as graduates in Industrial Organization Engineering. Consequently, they establish a superficial learning approach to the subject. Obviously, the first step to improve this situation is to find out what is the real perception that students have of the subject. With this purpose, an opinion questionnaire is proposed, as a tool to be transmitted to the students and thus be able to find out this information. This survey measures the students' perception of the subject in relation to their future work, satisfaction with the contents taught and satisfaction with the practical activities carried out. On this basis, a set of improvements could be proposed in the teaching-learning process of the sub-subject, which will be applied in the following courses.

Keywords: Student's perception, subject improvement, teaching-learning process.

1 INTRODUCTION

The research is mainly focused on knowing the perception that students have of the "Degree in Industrial Organization Engineering" (hereinafter GIOI) of the subject "Integrated Information Systems" (hereinafter SII) in terms of the importance that has for their future work and, consequently, the importance they give to their training in this area.

This research is proposed because, after several years of experience teaching subjects in the degree of GIOI, within the UPV, it has been observed that the students of the degree do not give too much importance to the subject of SII. It seems that they have a perception of the subject, as it is something alien to them, closer to the IT professionals, which is outside of their work environment and has no direct application in the possible performance of their future work as graduates in Industrial Organization Engineering. Therefore, they establish a superficial learning approach in terms of SII concepts.

However, nothing is further from reality. The SII are a fundamental subject in the future work of a GIOI, and this is included in the "Study Guide" of this degree at the UPV, which describes the skills to be acquired by a graduate in this degree.

In this way, it can be said that the specific objective of the research is to find out what the perception that the GIOI students have regarding the importance of the SII in their future work, and if they would like to work in some type of occupation that had relation to this matter.

Thereby, depending on the result obtained, a specific learning strategy for the subject SII could be proposed in the future, within the GIOI degree of the UPV, adapted to this perception.

2 CONTEXTUALIZATION

Students' perception of a subject affects subjective variables, such as motivation, comprehension, etc., that condition their learning process. For example, when the contents of a subject are perceived as interesting, important and useful, students are more willing to learn that subject comprehending it.

In fact, Ausbel [1] pointed out that the most frequent cause of students' lack of motivation is that they do not see the real usefulness of the subject, that is, what it is going to be useful for. Therefore, the motivation seems to influence the way of thinking and, with it, the process and result of learning [2].

Actually, the perception that students have of a matter or subject, is directly related to the academic performance in it [3]. Evidently, the teacher can greatly influence and favour these subjective variables [4]. In this way, if you use appropriate teaching methods, you can get better vision, the perception that the student has on a discipline and thus capture their interest, which can help to achieve deep learning.

Of course, the first step to assess if there is an improvement in the perception of the student with respect to a subject is to know what is the initial perception of the student in this regard. That is why this research is proposed, in order to know the perception of the students, and depending on it, later on to be able to establish the appropriate strategies, and finally, to design the teaching-learning process that best suits the situation identified.

At this point, it should be noted that the research presented in this paper focuses on the subject of Integrated Information Systems that is taught in the Degree of GIOI of the UPV. Therefore, the context in which the subject is framed within the degree in which it is taught is explained below.

2.1 The Integrated Information Systems

Since the appearance of the first computers, information systems have been introduced in companies, as a powerful tool to optimize and improve their management. This introduction of the information systems has been progressive, evolving the information systems according to their area of application in the company and the existing technology at each moment. The historical evolution begins with the appearance of the first computers and accounting management systems, and continues with the development of administrative management systems, stock control, MRP (Material Requirement Planning), MRP II (Manufacturing Resources Planning), until reaching the current ERP (Enterprise Resources Planning) systems [5]. These systems, the ERP, which in addition to this receive different names such as "Information Systems for Management", "Integrated Management Systems", or "Integrated Information Systems" [6], integrate all the functions and processes of management of the company in a single application [5]. With this kind of system, an effective and efficient management is achieved, and that is why this type of IS is the reference solution in the current market [6].

Currently, no type of management is conceived within a company, without an associated Information System that allows processes to be managed efficiently. Thus, the management of production, warehouse management, logistics, quality, etc. rely on information systems, which allow collecting, storing, analyzing and exploiting information, in order to finally make appropriate decisions in each of the company's areas. If these information systems are also integrated, efficiency is greater, because having a single system reduces duplication and redundancy of data, errors, the need to learn and manage different systems and applications, etc. [6]

2.2 The subject SII within the Degree in GIOI at the UPV

The work of a graduate in GIOI will be linked to the positions of responsibility of the companies, in any of their departments, both in the industrial sector, as in the services, through the direction and management of projects or as responsible for the areas of production, maintenance, quality control, logistics, R & D Consequently. Then, a graduate in GIOI must be capable of carrying out tasks such as Managing Production and Operations, Analyzing, designing and improving Logistics Networks, Analyzing, designing and improving Physical Distribution (Warehouses and Transportation), Analyzing, designing and improving Procurement, Manage Quality, Safety and Environment, Manage Technology and Technological Innovation, Manage Information Systems, Manage the Organization, etc.

In order to develop this professional work, the Degree in Industrial Organization Engineering trains graduates who can advise, operate or improve organizations, production systems, processes, services or information systems to promote the competitive advantage of companies, taking into account the human aspects and the economic viability of the designed proposals.

Obviously, for all this, it is necessary to have an adequate Information System, and therefore there is a subject of "Integrated Information Systems" in the curriculum of GIOI. This curriculum consists of 240 credits, and is designed with a module structure. Specifically, the planning of the subjects includes 5 modules, which are structured by matters, and each matter can consist of one or more subjects.

The Module of "Technologies of Industrial Organization", which is mandatory, includes the subjects that are defined as basic and essential for the profession of Industrial Organization Engineer. It is distributed in the following matters, among which is the subject of study in this work, SII, which is taught in the 2nd semester of the 3rd year:

Table 1. Subjects of the Industrial Organization Technologies Module

Matters	Credits
Quantitative Methods of Org. Industrial	9
Organization of production	19.5
Industrial economy	9
Management of Industrial Companies	13.5
Integrated Information Systems	6
Quality Control	4.5
TOTAL	61.5

On the other hand, the Specific Electives Module, of 36 ECTS, which is developed in the 4th year, is structured in three routes or intensification itineraries. Among those routes is the path of Industrial Organization, constituted by the Common Matter via Industrial Organization (18 ECTS, taught in 4 subjects) in the first semester of the course, and the Matter of Intensification, in the second semester. The offer of intensification subjects of GIOI at the UPV at the moment, is as follows:

- Intensification in Production and Logistics (18 ECTS, divided into 3 subjects, of 6 credits each)
- Intensification in Integrated Information Systems and Knowledge Management (18 ECTS, divided into 3 subjects, of 6 credits each)

Obviously, this is a very clear indicator of the importance of the SII in the future work of a GIOI. Given that, at this time, and according to the needs of the labour market, the possible routes and intensifications that appear on the web of the ETSII of the UPV (up to a total of 8) there are only two intensifications active, and one of them is focused on the SII and knowledge management.

Therefore, everything suggests that students should take this subject as an important one of their studies, at a similar level to the central matter of the other intensification, production and logistics.

In fact, within the 8 specific competences that a GIOI must acquire in their studies, all of them are related to the SII, but there are 2 whose acquisition are unequivocally (and almost only) related to the subject, such as:

- 16. (E) Select and calculate the appropriate indicators for the internal management of the different areas of the industrial company or organization
- 17. (E) Design, project, plan and manage the information of an industrial company or organization using the appropriate technology and systems

In this same line, Marin-Garcia et al [7] within the area of Information Management, propose in specific competences of a GIOI: "Develop and deploy information systems to support the business decisions. Model and develop computer applications or consultations for the applications related to information management and the company (CIM, MRPII, ERP, SCM, etc.)". In a similar way, we can analyse the proposal of Marin-Garcia et al [8] that they propose as specific competences in relation to Information Management, the following two:

- 36. Manage the storage and retrieval of information
- 37. Develop and deploy information systems to support business decisions. Model and develop computer applications or queries to applications related to the management of information in the company (CIM, MRPII, ERP, SCM, etc.)

3 PROPOSAL OF QUESTIONNAIRE TO KNOW THE PERCEPTION THAT THE STUDENTS HAVE OF THE SUBJECT SII

After everything presented in previous sections, the importance of the SII in the future work environment of the students is evident. But, do students perceive that subject with the importance it has?. It seems that it is not like that, but there is no evidence of that.

For this purpose, a survey has been designed in order to be transmitted in paper format to the students of the SII subject in the UPV. This will be done on the first day of the course, and will be filled in the class. The design of the survey has been done based in different works related, and has been reviewed by different lecturers.

In the survey there are a total of 9 questions of different types.

The first four questions ask the students about the perception they have about the subject, if they will like it, if it seems interesting, and if in the future they would like to work on something related to it. These questions have been designed based on a Likert scale, in which the 5 options range from "Totally Disagree" to "Totally agree" with the affirmation of each of them.

Afterwards, the students are asked about the objective they have for the course, and they are given some options. The sixth question asks of whether, in case of being able to choose subjects, they would choose the SII and why.

Finally, 3 free text questions are presented. In them they are asked if there is a specific topic on the agenda that interests them especially, if there is a topic they do not want to see at all, and if they have any additional comments to make. Some of these questions will allow a more quantitative analysis, and others aim to obtain qualitative information. But all of them together can give a very important information when it comes to knowing the perception that students have of the subject of SII.

The questionnaire is presented in its original format in Annex I.

4 CONCLUSIONS

In this work, an analysis of the situation of the subject of SII in the GIOI of the UPV has been presented. After that, considering its importance, and given that it is felt that students perceive it as something unimportant or foreign to them, a questionnaire has been proposed in order to analyse the perception of the subject by the students. This questionnaire consists of nine questions, which will provide valuable information, which once analysed, can help focus the subject and get students to increase their motivation to take it. On this basis, a set of improvements could be proposed in the teaching-learning process of the sub-subject, which will be applied in the following courses.

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ANEX I

Start of course survey

Answer the following statements as you agree more or less, knowing that:

1 Strongly disagree

2 Rather disagree

3 Neither agree nor disagree

4 Rather agree

5 Totally agree

Question	**1**	**2**	**3**	**4**	**5**
1. I think this subject will be useful in your professional future					
2. The content of the subject I find interesting					
3. I think I will like this subject					
4. I think I would like to work on something related to the subject					

5. My objective when taking this subject is: (choose only one)

	Approve
	Take a good mark for the file
	Learn everything possible about the subject
	I have no objective

6. If I could, I would choose this subject because: (choose only one)

	I think it's easy to approve
	I think I'll like it
	I think it will be useful
	I would not choose it

7. Is there a topic that interests you especially?

8. Any topic that you do not want to see at all?

9. Additional comments