



13<sup>th</sup> International Conference on Industrial  
Engineering and Industrial Management

XXIII Congreso de Ingeniería de Organización

A large, abstract concrete sculpture with a central archway, set against a blue sky and a green field. The sculpture is made of dark, weathered concrete and has a curved, modern design. The archway is the central focus, and the sculpture is positioned in the middle ground of the image.

**Organizational  
Engineering  
in Industry 4.0**

**BOOK OF ABSTRACTS**

**Gijón, 11th-12th July 2019**

## **Book of Abstracts**

**“13<sup>th</sup> International Conference on  
Industrial Engineering and  
Industrial Management” and  
“XXIII Congreso de Ingeniería de  
Organización (CIO2019)”**

**Book of Abstracts**

**“13<sup>th</sup> International Conference on  
Industrial Engineering and Industrial  
Management” and “XXIII Congreso de  
Ingeniería de Organización  
(CIO2019)”**

**COORDINADORES**

**DAVID DE LA FUENTE GARCÍA**

**RAÚL PINO DIEZ**

**PAOLO PRIORE**

**FCO. JAVIER PUENTE GARCÍA**

**ALBERTO GÓMEZ GÓMEZ**

**JOSÉ PARREÑO FERNANDEZ**

**ISABEL FERNÁNDEZ QUESADA**

**NAZARIO GARCÍA FERNÁNDEZ**

**RAFAEL ROSILLO CAMBLOR**

**BORJA PONTE BLANCO**

© 2019 Universidad de Oviedo  
© Los autores

Servicio de Publicaciones de la Universidad de Oviedo  
Campus de Humanidades. Edificio de Servicios. 33011 Oviedo (Asturias)  
Tel. 985 10 95 03 Fax 985 10 95 07  
[http: www.uniovi.es/publicaciones](http://www.uniovi.es/publicaciones)  
[servipub@uniovi.es](mailto:servipub@uniovi.es)

I.S.B.N.: 978-84-17445-38-6  
DL AS 1875-2019

Imprime: Servicio de Publicaciones. Universidad de Oviedo

Todos los derechos reservados. De conformidad con lo dispuesto en la legislación vigente, podrán ser castigados con penas de multa y privación de libertad quienes reproduzcan o plagien, en todo o en parte, una obra literaria, artística o científica, fijada en cualquier tipo y soporte, sin la preceptiva autorización.

# Understanding and representation of organizational training programs and their evaluation

Ruiz M<sup>166</sup>, Igartua JI<sup>167</sup>, Mindeguia M<sup>168</sup>

**Keywords:** organizational training, training; training evaluation; training program; Group Model Building; System Dynamics.

## 1 Introduction

The training processes within this human based paradigm are considered key for competitive advantage as the evolution of the company on its own could devalue the worker competencies (del Valle and Castillo, 2005).

Consequently, knowledge and skills of workers are devalued, and it is necessary to apply human resource management policies to ensure the durability of human labour in the company. This durability which is dependent on factors such as experience, skills, abilities, or capacity to adapt are the elements that bring to the company the sustainable competitive advantage necessary to be successful (del Valle and Castillo, 2005).

---

<sup>166</sup>Maria Ruiz Amurrio (e-mail: mruiz@mondragon.edu)  
Mechanical and Industrial Production department. Mondragon University. Engineering Faculty.C/ Loramendi, 4. Arrasate-Mondragon (Spain).

<sup>167</sup>Juan Ignacio Igartua (✉e-mail: jigartua@mondragon.edu)  
Mechanical and Industrial Production department. Mondragon University. Engineering Faculty.C/ Loramendi, 4. Arrasate-Mondragon (Spain).

<sup>168</sup>Maitane Mindeguia Urroz (e-mail : mmindeguia@mondragon.edu)  
Mechanical and Industrial Production department. Mondragon University. Engineering Faculty.C/ Loramendi, 4. Arrasate-Mondragon (Spain).

## 2 Objectives

The main aim of this research is to analyze and represent using System Dynamics (SD), the process of evaluation of training programs to define them in a more effective and profitable way.

## 3 Methods

A Group Model Building (GMB) session was used for the definition of the conceptual model. The resulting model has four main groups:

1. Training assessment: This loop explains how the training evaluation is done. Interaction with students is a direct way to do it.
2. Assessment impact: This loop refers to the effect of the assessment on the principal phases of the learning process.
3. Striker: This loop refers to the phase in which learners have achieved new skills, and their self esteem is higher.
4. Initial diagnosis assessment: This loop refers to that phase of “wish to improve” mentioned in the previous loop, and its effects.

## 4 Results

The variables simulated were: Learning related attitudes and habits, spontaneous strategies and reasoning, already acquired knowledge, personal experiences, satisfaction level, new acquired competencies, and transfer the learning to the workplace. Different levels for these variables were applied in the simulation. The result was a linear growth of the wish to improve of the learners, and effectiveness of the training programs.

## 5 Conclusion

This research presents a conceptual model to represent the phases of a learning process, and the variables used for its evaluation. This model could be used to understand which variables influence the training effectiveness, and the interrelationships between them, represented as a whole system. On the other hand, the simulation model is useful to represent in an interactive way the training process, and visualize their effect on different phases of the training program, and its evaluation. Finally, the simulation of scenarios was used to present in a dynamic way the change over time of two variables.

## References

- Alsina MIB, Rodriguez FAC (2001) Estrategias de evaluación de los aprendizajes centradas en el proceso. *Revista española de pedagogía*, 25-48.
- Luna-Reyes LF, Ran W, Jarman H, Zhang J, Andersen DL, Tayi GK, & Andersen, DF (2013). Group model building to support interdisciplinary theory building. *Cent. Technol. Gov.* Albany.