

Creation of Professional Certificates for the Automotive Industry

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Abstract

One of the greatest challenges in the educational world of the 21st century is to achieve the transition from a traditional memoristic-cognitive model to a teaching-learning model, which contributes to strengthening the training of new generations in accordance with different work scenarios in the near future. As a result, the Office of the Vice-Rector for Strategic Evolution at the University of Monterrey decided to start working on a redesign of the curricular structure that promotes interdisciplinarity, mobility, internationalization and links with companies, through the use of agile frameworks and methodologies.

Using the functional structure of this method - planning, sprints, refinement, review, retrospective, among others. - and various design thinking techniques - crazy eights, insights, empathy processes - innovative ideas were generated. Through research of cutting-edge educational models and the best training methods worldwide, as well as interviews and validations with industry representatives, professors and students from different universities, a prototype of an academic program was created and further developed. It is important to note that as a result, it takes into account **innovation** and flexibility in duration, modality, delivery, own university degrees, etc, in order to acquire the competencies, i.e. the knowledge and abilities, to enter the labor market.

It was decided to carry out an **experiment** in the School of Engineering and Technologies of the university, considering the context of **smart mobility** and the operation of **electric vehicles** of the upcoming and highly anticipated arrival of TESLA in Nuevo Leon, Mexico, that is meant to open in 2024. This experiment consists of the creation of professional **certificates** based on the subjects of the current academic program, which favors the personal and professional growth of students and promotes the differentiation of specific graduate profiles.

These certificates are scheduled to start being offered in the semester of fall 2023. In the initial communication phase, students have shown great interest, and there has also been an extraordinary response from the academic and business sector.

Keywords

Innovation, Experiment, Smart mobility, Electric vehicles, Certificates.

Biographies

Alexis Torrecillas is the Product Owner of an Academic agile team and Professor in the Engineering Department at the University of Monterrey, Mexico (UDEM). He was the Director of the Industrial and Systems Engineering Program, participating with the ABET Accreditation in 2019 and as general coordinator of the first Engineering Forum at UDEM. During his tenure as Academic Director, he motivated his students to participate in IEOM conferences, obtaining excellent results in recent years. He is an Industrial and Systems Engineer (Cum Laude) from UDEM, has a Master's in Business Administration and a Service Management Specialty from EGADE Business School. Also, he has worked as Undergraduate and General Director in other academic institutions in Mexico, as Business Development Manager in Servicios de Comercio Mundial (SCM) and as Operation Coordinator in FEMSA Logistics. He has extensive experience in service and operations management, being a project consultant and advisor

in companies such as Caterpillar, CEMEX, British American Tobacco, General Electric, Seven Eleven, Grupo AIE, among others.

Corazón Beas Zertuche works as a developer of an academic agile team within the Strategic Transformation Vice-Rectorate in the University of Monterrey (UEM), where she works under the SCRUM framework. She holds a Bachelor degree in Bilingual Education from Laurens University, Monterrey, Mexico, a Master of Arts degree in Human Resource Development and Consulting from the University of Lancaster, England, a Masters in Business Administration from the University of Monterrey, Mexico. She has worked as a German and English teacher in Mexico, and as a Distribution representative for National Semiconductors in Munich, Germany. She has published a paper for Administrative Science, called “Proposal for a generational compensation model”. Her research interests include education and human resources.

Angélica Chapa has been a manager of curriculum design at the University of Monterrey. She is currently working as a member of an agile team. Ms. Chapa has a Master's degree in Education with a specialization in Cognitive Development from the Instituto Tecnológico de Estudios Superiores de Monterrey, Mexico, and has a Bachelor's degree in Tourism Business Administration from the Instituto Regiomontano de Hotelería. She has extensive experience in administrative and operational hotel management, convention and restaurant industry. She has been a pedagogical advisor in the development of academic and study programs at higher level education and a teacher for more than 30 years, teaching courses in administration, food and beverages, management and convention tourism. Ms. Chapa has also served as Synodal and President of the Evaluating Jury in professional exams, qualifying jury in gastronomic competitions and external collaborator in various articles for some industry and local magazines. She was a member of associations such as PCMA (Professional Convention Management Association) and AMPROFEC (Mexican Association of Professionals in Exhibitions, Fairs and Conventions).

Manuel B. Hernández is a member of the Transformation team at the University of Monterrey, currently participating in the development of strategies for the Strategic Transformation Unit. Hernández has a Bachelor's degree in Business Administration from the Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) and a Master's degree in Marketing from EGADE (Escuela de Graduados en Alta Dirección de Empresa). He has participated as an adjunct professor at the Business School in UEM, Postgraduate Director, Academic Management Chair and worked as a consultant for several companies. He has taught courses on Marketing, Brands, Innovation, Management and Communication at a corporate level. Mr. Hernández has participated in private companies as Brand Manager, Brand Category Manager, Trade Marketing Manager and in charge of channels such as Convenience and Self-Service. He has developed different consumer brands in various categories and has participated as a member of the Marketing Academic Department in UEM and in certifications such as AACSB and AMBA. He likes to participate in leadership activities of youth sports groups and collaborate in various community aid associations.

Mayra Angélica Hinojosa is a member of an academic agile team within the Strategic Transformation Vice-Rectorate in the University of Monterrey (UEM). Hinojosa has a Bachelor degree in Psychology from Universidad de Monterrey, México. She has worked at Prepa UEM in the Psychology Department, and as a Human Development and General Psychology teacher. Hinojosa has been a counseling advisor in the International Baccalaureate Career-related Program, motivated and helped her students to discover their vocation and make a plan for their future life. She has experience in providing psycho-pedagogical assistance, guidance and counseling for students. She has an extensive experience in learning and social service that guides the student to develop leadership skills, share their talents, skills and knowledge for the good of society.

Hiram Alejandro Cantú Campos holds a bachelor degree in Biomedical Engineering from Universidad de Monterrey (UEM). He earned a MSc degree in Biomechanics from the Department of Kinesiology and Physical Education at McGill University. Currently, he is a PhD candidate in Kinesiology Sciences (Clinical Biomechanics) from the same Department and University, and his research work focus on better understanding the freezing mechanisms in individuals with Parkinson's disease. Before enrolling in graduate studies, he worked in the Biomedical Engineering Department at the Hospital Metropolitano Dr. Bernardo Sepúlveda A. B. P. During his graduate studies, he was tutor in physical therapy sessions for Parkinson's patients at the Cummings Jewish Centre for Seniors in Montreal. He also worked as teaching assistant in biomechanics courses at McGill University. He received different grants while being a graduate student, such as the CONACYT Fellowships for Master and PhD

studies, and the Bloomberg Manulife Fellowship given by Lawrence S. Bloomberg and the Manulife group. On June 1st, 2016 he joined the UDEM community as the Biomedical Engineering Academic Program Director. Starting on January 1st, 2022, he was appointed Dean of the School of Allied Health Sciences at UDEM. During his stay at UDEM, he has been teaching Biomedical Engineering courses for 7 consecutive years and he has been actively involved in institutional projects seeking innovative education. He received the Award for Research with Social Impact by UDEM in 2019. In 2023, he received the Pro Magistro Roberto Garza Sada Award, UDEM's annual excellence-in-teaching award.