

Building a solar-powered car and racing it on a Belgian racetrack in just 90 days seems a strange task for young students. But, say **Manuel Acevedo-Jaramillo**, **Sara Aguilar-Barrientos** and **Juan Esteban Escalante**, it has had a major influence on the pedagogic approach of one of Colombia's top universities

The power of dreams





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Building a solar-electric vehicle from scratch in 90 days seemed an impossible goal. Sending it from Medellín in Colombia to Heusden-Zolder in Belgium to compete in the iLumen European Solar Challenge seemed an even more remote possibility.

But both happened.

This is the story of CAMBRIA, a pioneering project from the Centre for Experimentation, Leadership and Development (CELD) at EAFIT University in Medellín, Colombia. This was an initiative that defied many institutional processes and, based on principles of experiential and challenge-based learning, opened an avenue for new complementary educational schemes and methods aimed at forming professionals capable of dealing with constantly changing circumstances.

Aware of the changing requirements for learning and the characteristics, expectations and behaviours of new generations of students and other stakeholders, universities need to modify many of their approaches to knowledge generation and transmission.

Faced with this situation, the EAFIT University Business School decided to enter the domain of experiential learning, after examining certain opportunities for improvement arising from prior projects carried out by the institution's Engineering School.

CAMBRIA, therefore, is the result of an initiative that sought to bring together students from multiple programmes and schools; an inclusive idea brought to life by a solar-electric vehicle that allowed both applying specific disciplinary knowledge and acquiring skills and competencies that would be difficult to do using traditional pedagogical approaches.

Designing, manufacturing, testing and sending a vehicle to a significantly distant location, all in less than six months and with a budget of around \$150,000, is hard to take in at first, especially given that automobile manufacturers spend years and invest millions of dollars to create and perfect new models.

In CAMBRIA's specific case, the tight deadlines involved meant start-up, planning, execution, control and closing stages for the vehicle as a project would need to be significantly accelerated, as the iLumen European Solar Challenge would be held over 24 hours on September 24th and 25th, 2016, at the legendary Zolder racing circuit in Belgium, where 12 solar vehicles, together with two Teslas, would undergo a unique endurance test.

To achieve this goal and participate in the challenge, a group of students, from different schools and with diverse profiles, would need to create an organisation, define functions and tasks, assign resources, and manage everything related to the vehicle's construction, financing, promotion and logistics. Would it be possible?

After many meetings and following an analysis of the initiative's viability, the idea of CAMBRIA as a pioneering project for CELD began to come together in May 2016. The team of people from different careers and schools was created through an open invitation issued via various communication channels.

Under the technical leadership of an MIT alumnus, an expert in solar vehicle manufacturing, and with support from deans and teachers belonging to the institution's business and engineering schools, an organisation was created that would be responsible for process design, budget planning and execution, investments and expenditure, activity and timetable control and follow-up as well as for managing sponsors, press and dissemination.

A weekly agenda of deliverables was defined and committees were set up to ensure milestone achievement and also contribute to solving any mishaps and contingencies that arose.

These were 90 days of intense work, especially by the students, whose commitment and passion became the driving force behind an idea and an initiative that became a reality. This initiative overcame all barriers and difficulties and allowed a group of people to participate in the iLumen European Solar Challenge, a dream that seemed distant and maybe even impossible.

Although CAMBRIA's performance surpassed expectations and the vehicle's results in terms of design, speed and innovation were highlighted by different participants of the iLumen European Solar Challenge, the benefits underlying this challenge need to be emphasised from the point of view of the pedagogical initiative.



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Project participation has provided the institution and its processes with valuable lessons. CAMBRIA has led the business school, for example, to reflect on how it formulates and offers experiential and challenge-based learning activities and the way in which these will affect the curriculum in terms of competencies and skills that need to be strengthened for dealing with high-impact, real-life organisational challenges.

It also provides an opportunity for considering the inclusion of similar activities for the entire student body, independently of each student's academic performance, as their effects impact the successful fulfilment of the business school's mission.

CAMBRIA as an experience also left an imprint on participants. Their testimonies evince the initiative's effects in different environments. At an academic level, they highlight the possibility to experience what they have learned in the classroom in the real world, make comparisons between theory and practice, and autonomously learn new knowledge during project execution.

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However, it is on a personal level that CAMBRIA's most notable impact on participants' lives can be noted. Some of them described the experience as "an encounter with themselves" or "the consolidation of the group as a family" while highlighting the commitment and responsibility required of them.



On a personal level, therefore, aspects such as relationships with others, motivation, resilience, appreciating and taking advantage of existing resources, conflict resolution and adaptability to new situations were strengthened.

Participants also highlighted the project's adventurous and challenging aspects, an initiative belonging to a "revolution" occurring in higher-education institutions and transforming academia. This offers indications for the institution when formulating projects related to experiential learning, especially regarding dissemination and recruitment.

After the success achieved by CAMBRIA and its experience at the iLumen the institution has several challenges on the horizon.

First, CELD must become consolidated as an educational scenario that will complement traditional academic activities and pedagogical approaches. This implies a detailed analysis of lessons learned, perfecting a working method with clearly identified guidelines and focusing efforts on searching for projects conceived under a framework of environmental, social and economic sustainability.

Equally, the people taking part in these types of initiatives need to be followed up both academically and professionally to validate what impact it has on their learning and expected competency development. A contribution to the body of knowledge surrounding experiential and challenge-based learning is also intended, seeking to generate a dynamic that will allow other business schools to replicate and strengthen this type of project.

CAMBRIA allowed the university to restate many paradigms related to its educational model. The results achieved and the transformation processes unleashed by this project open panoramas for exploring and growing alternatives that had not been considered previously.

CAMBRIA proved that dreaming is worth it and that great ideas arise out of apparently indecipherable problems and ratified, once again, that an infinitely powerful driving force exists called the will: a synergy between passion and discipline that turns the impossible into reality.



ABOUT THE AUTHORS

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