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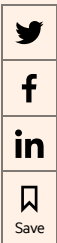
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The applicance of science via a business degree

Isabella Castiglioni used an executive MBA to translate research into medical technology

Real-world focus: Professor Isabella Castiglioni © Vittore Buzzi

Kate Hodge

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Just over a decade ago, Isabella Castiglioni, professor of applied physics at the University of Milano-Bicocca in Italy, hit a wall. She wanted to translate the results of her research into a social benefit, but "could not because I did not have the right competencies".

At the time, she was running a research laboratory at Italy's National Research Council, the CNR, focused on medical imaging. But her dream was to take her scientific results beyond journals and academia, and use them to create products and services to help physicians and patients.

So, in 2010, Castiglioni "returned to school, but on the other side of the chair" and enrolled on the executive MBA at Bocconi University in Milan.

The course was the "most challenging experience of my life", she says. That was due, in part, to balancing work, study and being a mother to two daughters, then aged 10 and 15. Castiglioni would be in class three nights during the week then get up at 5am at the weekend to complete coursework before her family awoke.

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Her first lesson from the EMBA was not to talk about it too much. While the professor wanted to tell her husband, children and friends about the programme, they did not share her excitement. Rather, they needed to see that "they are the most important things to you", she says, which meant curbing her desire to discuss the experience with them.

Another challenge was that Castiglioni's professional background and experience were different to the approach taken on the course. "I was a scientist," she says, adding that she had always been given time to focus solely on achieving excellent results. There was a "very different attitude" and pace on the EMBA, however. It was more about "how to manage errors and risk in a very, very fast way", she says.

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An EMBA 'is about how to manage errors and risk in a very fast way . . . everything has a different velocity'

One after-effect of this intensity hit Castiglioni when the course ended. "During that period [on the EMBA], everything has a different velocity," she says. But when it finished, much of life outside work felt "a little flat" and "boring", and she found it difficult to focus on spare time and holidays when her work seemed so exciting. "Fortunately, with a little time I found a balance," she adds.

"I expressed this feeling to my [executive] coach and she said it was very common at the beginning when you finish, but then after one or two years, everything changes and

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becomes normal [again]."

But Castiglioni was already looking for an avenue to channel her energy, in the form of "killer applications" to take to market. "I started to work with my best [postgraduate and research] students to find a solution that applied our skills in artificial intelligence to medical imaging," she says.

Early warning: MRI scans can be analysed using artificial intelligence to help detect early signs of Alzheimer's disease © Andrew Brookes/Getty Images

Alzheimer's disease was her first stop. Magnetic resonance imaging (MRI) of the brain has the potential to find early signs of Alzheimer's, she explains, but radiologists have to look at many image points and that means crunching data. By 2018, Castiglioni's team had trained and tested an AI system that could analyse MRI scans to detect within minutes early signs of Alzheimer's and then to offer a prognosis. The system was 85 per cent accurate, as determined by the follow-up of patients later, she says.

The same year, along with one of her students, Christian Salvatore, Castiglioni co-founded DeepTrace Technologies, a spin-off from the University School for Advanced Studies Pavia in Italy. "We train tools on clinical patient data and develop predictive models that are able to make a diagnosis, prognosis and to predict the response to treatment of every individual," she says.

In January 2020, the company secured €1.7m in seed funding from investment fund Progress Tech Transfer. Currently, two of DeepTrace's products carry the European CE health and safety marking: Trace4AD, which applies AI to MRI scans to predict the risk of Alzheimer's; and Trace4OC, which also uses AI to analyse ultrasound images to predict the risk of ovarian cancer.

CV

DeepTrace has other products in its portfolio, including one that senses plastics in oceans

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2019-present Professor of applied physics, University of Milano-Bicocca

2019-present Honorary president and scientific adviser, DeepTrace Technologies

2019-present Associate researcher, Consiglio Nazionale delle Ricerche (CNR/National Research Council)

1997-2019 Researcher, CNR

remotely using drone images and another that applies AI to infrared or X-ray analysis of old artworks. There are a further 10 in the pipeline, according to Castiglioni.

The EMBA provided valuable lessons on economics, finance, business plans, balance sheets, sustainability and working capital, she says. "It is the best MBA because you return home and in the morning you can apply at work what you have learnt during your class," she adds.

Beyond technical competencies, Castiglioni credits the course with transforming her soft skills.

"During the MBA, there were a lot of group activities and I was judged by my colleagues," she says. "I realised I was not open to listening to others, not open to considering their thinking or results . . . so I dedicated a lot of time to improving my soft skills."

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I realised I was not open to listening to others, so I dedicated a lot of time to improving my soft skills

Working with her coach on the course, Castiglioni shared an anonymous questionnaire with her colleagues, researchers and PhD students to evaluate her soft skills. The first results were "terrible", she says. This partly comes from leading a laboratory, "because when you want to achieve excellent scientific results, you are very rigorous", which means asking a lot from students.

She has since learnt how to "work in a more comfortable way", she says, and applies this at DeepTrace, where she is now honorary president and scientific adviser, while Salvatore has become chief executive.

That does not mean Castiglioni is slowing down. There is a business plan in place to scale up DeepTrace in Europe, the US and Asia over the next five years, she says. She is kept busy at the company alongside her jobs as a professor and scientist — a union of roles she says is a perfect fit. Indeed, her advice for anyone thinking about studying for an EMBA is to pursue it "with a passionate and determined attitude".

But despite the "velocity" she experienced on the programme, Castiglioni sounds a note of caution about rushing. To make the most of an EMBA, she says, "you have to do it at the right time in your career — not too early".

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