Having concluded and completed my Bachelor’s Degree in Chemistry with a dissertation focusing on synthetic green organic chemistry, I opted to carry out a full-time Masters (by research) in the same field in order to further expand my knowledge whilst improving my research skills. The degree was carried out following the award of an Endeavour Scholarship and was part-financed by the European Union – European Social Fund (ESF) under Operational Programme II – Cohesion Policy 2014 – 2010, “Investing in human capital to create more opportunities and promote the wellbeing of society”.

The course involved carrying out research on various previously-studied multicomponent reactions (MCRs) in order to try to improve their yields whilst making them more environmentally benign. In a nutshell, an MCR can be improved by first carrying out catalyst screening and condition optimization on a model reaction with a constant set of reactants. Once the ideal scenario is identified, the reactants are varied in order to expand the product-substrate scope with the aim of improving yields of products that have already been synthesized and also to try to synthesize completely novel ones. Undoubtedly, it is futile synthesizing products if their identity is not confirmed and hence these need to be characterized by various spectroscopic techniques, namely infra-red and nuclear magnetic resonance spectroscopy and mass spectrometry.

In my Masters I carried out the above described process for two main reactions which were the KA2 coupling reaction and the aza-Friedel-Crafts reaction, both of which are MCRs because they require three reactants. Yet, my dissertation was based entirely on the latter one because of the large amount of work that I had put in studying it and the length limitations of a dissertation. Despite this, the KA2 reaction results were successfully published in a scientific paper: (Bosica, G.; Abdilla, R. The KA2 coupling reaction under green, solventless, heterogeneous catalysis. J. Mol. Catal. A: Chem. 2016, 426, 542 – 549).

Admittedly, having my research published in a peer-reviewed journal was quite satisfying as was the whole course itself once the final dissertation had been written. Although in some cases the research process became significantly difficult owing to unforeseen results and side-product formations, it left a fulfilling effect. Frankly, I find that research work goes hand-in-hand with my mentality and character because I hate repetitive work but relish problem-solving scenarios. Having said that, I hope that the research skills which I have strengthened make it easier for me to find a job in this field by for example researching and developing
new synthetic pathways of drugs in the pharmaceutical industry. In Malta, this should not be difficult because there are various pharmaceutical companies which have been set up mostly because of the favourable taxation system in our country.

All in all, my Masters course helped to quench my thirst for organic chemistry, a subject which I adore because it can be found in all aspects of life; from the contents of a centimetre-sized drug to the biological processes taking place in a human-being.