

Development of research and transferable skills in an interdisciplinary project-based curriculum

Here I present an experimental interdisciplinary curriculum at the Bachelor program Frontiers in Life Sciences, University Paris Descartes, which was designed to develop research skills through authentic project-based learning. The program emerged from the need to unite five natural science disciplines (mathematics, computer science, physics, chemistry, biology) and provide an active learning environment where the students experience research. The focus of this learning-through-research curriculum was placed on creating an interdisciplinary program, with special emphasis on the acquisition of research skills (proposing interesting scientific questions, elaborating hypothesis and experimental design, data analysis and scientific communication). Nonetheless, the choice of project-based learning, coupled with team work and formative peer and self-assessments, had an unexpected impact on the development of transferable skills, including creative problem solving, stress and conflict management, communication and collaboration skills, learning how to learn and adapt, and many others.

I will present the qualitative and quantitative feedback collected from students from 5 generations who have experienced 2 to 4 learning-through-research modules in a 2-year period. Their feedback was collected immediately after the completion of individual modules, following the completion of individual modules, and/or several years after the completion of the modules. The goal is to assess if this unique learning environment and pedagogical approach had an immediate and/or long-lasting impact on the development of the research and transferable skills, as well as the career choices and scientific interests.

To my knowledge, curricula that systematically teach research skills, by gradually introducing those skills, while increasing student research autonomy, do not exist yet in a mandatory form for undergraduates anywhere in the world. The insights from 5 years of teaching these courses in Paris show that they bring essential professional skills and early scientific maturity to undergraduate students.