

# H2020 INTEGRITY PROJECT: PROMOTING ACADEMIC INTEGRITY AT PORTUGUESE HIGH SCHOOLS VIA DEVELOPING MODULE AND ASSESSMENT STRATEGIES

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## Keywords

Academic Integrity; Dilemma cases; High School Students; Teaching Integrity

## Abstract

Empowering students in academic integrity and responsible conduct in research (RCR) is a complex and pressing matter, particularly in light of the easy access to information and data that comes with the digital age, and the evolving context of educational policies and structure (Sutherland-Smith, 2016; Steneck, 2006). Presently, across Europe, there is a lack of general guidelines on how to teach academic integrity, and great differences are observed in the teaching approaches employed by professors, the topics covered, the learning aims and the levels of engagement (Bretag, 2016; Lofström et al., 2015; Simon et al., 2019). Moreover, whenever such teaching courses are implemented, this is usually only at the Higher Education level, targeting bachelor, master and/or PhD students (Goddiksen et al., 2020; Lofström et al., 2015). High school students rarely receive formal training in academic integrity and RCR aspects (Goddiksen et al., 2020; Hossain, 2022), despite the pertinence of these issues both within the high school context and as preparation for higher education. In addition to that, a fundamental question concerns how to best implement academic integrity training in school teaching, since most European high school programmes are based on

a structured curriculum, with limited focus on integrity.

The H2020 INTEGRITY project builds on the understanding that academic integrity depends on students and young researchers knowing what is responsible conduct in research and having the confidence and means to act with responsibility. The project seeks to empower students at three levels (high school, undergraduate, and PhD) and in various academic disciplines (including STEM, social sciences, humanities and the arts, as well as high school's interdisciplinary curriculum) through training tools tailored for each level and discipline.

Here, we will present the pedagogical approach adopted in INTEGRITY to develop tailored teaching modules about academic integrity and RCR to high school students. This is based on INTEGRITY's European survey study that gathered information about the high school students' perceptions and experiences with RCR and integrity issues (Johansen et al., 2021; pending revision). Particularly, in this survey, high school students were asked questions that aimed to assess their level of understanding of

appropriate and inappropriate academic practices (e.g. Self-reported understanding of what is good practice in relation to three dimensions of academic integrity: citation and plagiarism; working with others and assigning authorship; collection, analysis and presentation of data) and their personal experience with such practices (e.g. Self-reported engagement in questionable academic practices among upper secondary students – During your high school education have you...). The findings from this survey study allowed us to identify four major academic integrity issues (1-collaboration and working together; 2-collection, analysis and presenting data; 3-drawing on the work of others; 4- reporting misconduct and other unethical actions) that were then incorporated into our teaching modules.

The high school portfolio takes into account the transdisciplinary curriculum at this education level, and our team worked on modules for the life sciences. In order to make the tools easily integrated within school's curriculum and more appealing for students and teachers, and ensure their long-term implementation, we opted for incorporating integrity teaching with topics that are part of the Portuguese high school curriculum and that are part of our ongoing outreach program for high schools. Animal Experimentation and Genetic Testing were chosen as topics which are both scientifically and ethically interesting.

Each module was designed and structured to provide a brief introduction to concepts and terms relevant to the subject (e.g. meaning of research, research integrity, ethics of animal experimentation and genetic testing, among others). Then, a practical activity, based on a

gamification scenario-case board of students' every day school situations, was developed for each module, to promote students' discussion and critical reflection about misconduct and questionable practices. We strived to connect the school situations to the research integrity cases; e.g. the temptation to manipulate results to gain recognition and the possibility to unconsciously bias results which underlie the integrity cases were also present in the student dilemmas. The modules concluded with an overall class discussion, which outlined the key ethical and research integrity issues that were identified by the students as they worked through the modules.

We will present the results of the testing of the two modules in 6 Portuguese high schools, and the challenges observed. Informal feedback from the students was collected through direct sharing of opinions, during the classroom testing of the modules. Feedback from the teachers was collected through a structured survey, which aimed to assess the suitability of the modules regarding their learning aims, students' engagement level and the likelihood of teachers to use such modules again in teaching classes. Overall, both the students and the teachers found the modules to be relevant, well-designed and to promote very interesting discussions among high school students on academic integrity and RCR issues. Students expressed that they particularly enjoyed the opportunity to critically reflect with their peers on integrity issues during the game-board activity and to learn about the ethical aspects of both animal experimentation and genetic testing. Teachers said they would like to continue to apply the developed modules in their teaching classes in the future.

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