ONLINE FRENCH PHYSICAL SOCIETY QUESTIONNAIRE: A WAY TO IDENTIFY STUDENTS' DIFFICULTIES AT THE ENTRANCE AT UNIVERSITY

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FRENCH CONTEXT

In France, entry to university is determined by a national examination taken by all students in their final year at high school, the *Baccalauréat* (K12). Yet, its success rate (over 90%) no longer guarantees a satisfactory level of the laureates. French universities, where enrolment is (almost) free, are nevertheless legally obliged to accept all passed students. On leaving high school, other choices for students wishing to train in physics are to join either a preparatory school for engineering schools (CPGE), which is free for the most part, but is selective and includes intensive training, or a free and selective three-year professional course, or to enter university. The latest statistics show that only a small fraction of students who have followed a scientific course in high school choose to go to university (Inspection Générale - Ministry of National Education, 2022); scientific university tracks thus deal with students who are often already in difficulty and have to adapt their courses to help them succeed. Even if some universities have set up placement tests to organise support courses, there is no national system to monitor the evolution of students' levels and provide an overview.

ONLINE PHYSICAL SOCIETY OF FRANCE QUESTIONNAIRE

In this context, the French Physical Society has designed a one-hour online questionnaire (MCQ; Questionnaire de la Société Française de Physique, 2014) to help university teachers identify their students' difficulties. With four parts (basic mathematics, mechanics, waves and scientific culture) and around 100 questions, it can be completed in one hour and provides immediate feedback to students and their teachers on the answers provided. It also allows for the collection of data from all over the country. This MCQ, the content of which was chosen to comply with the high school curriculum (Ministry of National Education, 2019), consists primarily of questions on concepts, based on situations identified as likely to induce reasoning difficulties (Viennot, 1996) and is inspired by existing questionnaires (FCI, 1985 for example; Hestenes et al., 1992).

Launched in 2014, this questionnaire was taken by more than 3000 students. It provides an admittedly partial view (but the only one available to our best knowledge) on the evolution of French students' understanding of concepts by the end of high school. We will present the results obtained by both CPGE classes and university students, and their evolution following the reform of the high school curriculum and the effects of COVID-19. While first analyses confirm the expected difference in level between the two populations, they also document, for both tracks, a significant decrease over time in the understanding of several concepts.

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