

# Problem Based Education on the interface between the School of Engineering and the K-12

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**Abstract** — Problem Based Education is an important learning tool that associates a real problem born outside the walls of the academia or the pre-university school to the educational environment. The first feature to be discussed is the advantage of the intrinsically interdisciplinary aspect of this kind of problems in order to direct the learning process from reality to the establishment of knowledge, within an environment that is common to the Schools of Engineering and the K-12, and where the commonly accepted educational mechanism considers that applications must follow knowledge creation and dissemination within a traditional sequential set of disciplines. The interface of the K-12 and freshman disciplines is treated by acknowledging that several questions are common to the first two years and the outreach programs dealing with the K-12, most of them represented by the growing need to add more attractiveness to the area of Engineering. The profile of the student of the last couple of years in the high school presents similarities with that of the freshman students. This profile is presented by the student's need to frame their studies in the real world, where scientific and technical problems blend with social and human questions. This "real world" contribution brings questions treated in the newspapers and other media to the classroom, adding to the student's daily life in the school the flavor of the daily life outside the school. The interface of the school of Engineering of the Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Brazil, is discussed as an example; the outreach program (PIUES) develops the same set of problems either for High School students as for freshmen in the same laboratorial environment. This activity is also discussed considering the necessity to increase laboratorial activities in the high school programs, mostly in Latin America where didactic laboratories are rarely found in the pre-university school.

**Index Terms** — Pre-university studies, School of Engineering, Problem Based Education.