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IMPROVING TEACHING THROUGH RESEARCH EXPERIENCE

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The need for constant, high-quality professional development for high school teachers (HST) has been widely recognized as essential to address society's evolving needs and to motivate and retain teachers. This is particularly critical in STEM fields, where there is a shortage of educators alongside growing job opportunities outside the education system. As highlighted by OECD since 2005 (Teachers Matter) teacher quality is the single most important factor influencing student outcomes.

We present Programma INFN per Docenti (PID), a residential professional development course aimed at improving HST knowledge of cutting edge physics research, creating a strong link with scientists, and motivating them to innovate classroom activities.

Bringing science teachers into a research environment fosters improvement in their work experience by provinding hands-on experience of research, both as methodology (i.e. scientific inquiry being applied daily), and operational (teamwork), update their knowledge of frontier research and related technological development, increase awareness of opportunities available for their pupils. Moreover the format fosters the creation of informal networks among participants and with researchers involved in the program. Since 2018 more than 300 teachers took part.

Each course lasts from Monday to Friday for a total of 40 hours and includes both lectures and hands-on laboratories, where participants (divided into groups) rotate. Teachers perform -in collaboration with scientists- actual measurements, directly derived from the research activity of the host institute. The goal is to translate what they've learned into classroom activities using their creativity and skills.

Through discussion with peers and scientists, they share ideas, and experience to develop teaching paths that can be brought in the classroom. The methodology emphasizes "learning by doing" where lessons are tied to laboratory activities. By leveraging the complementary research conducted at the involved facilities (three Nat. Lab. and a Gravitational Wave Observatory), teachers gain broad knowledge of the Institute's research in Italy, strengthen (or acquire) laboratory skills, and build direct relationships with researchers.

We will present results of surveys performed both at the end of the courses, and one year later, demonstrating the positive impact on participants' didactic and personal self-reliance, and also report on the increased opportunities for pupils.

Secondary track

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