

Research-based Approaches to Preparing Teachers in Grades K-6 to Teach Foundational Physics Concepts and Skills through the Practices of Physics

Federico CORNI

Department of Education and Humanities, University of Modena and Reggio Emilia, Italy

Stamatis VOKOS

Department of Physics, California Polytechnic State University at San Luis Obispo, USA

Abstract. The preparation of teachers of students aged 5 to 12 is of crucial importance to every country's educational system. Teachers in grades K-6 are called to immerse students not only in investigations of phenomena across the sciences but also help them to develop reasoning skills and productive epistemological stances toward the sciences. Unlike other sciences, such as biology, which spans different paradigms from ecology to cells, physics has a well-established canon at the secondary school and tertiary levels. But what about the primary level? Is there evidence-based consensus on the physics concepts, physics-related skills, and physics-specific habits of mind that students can master? Are there research-based models for teacher preparation that develop teacher efficacy in this area? In this Symposium, representatives from several teacher preparation programs will share their research-based perspectives and help GIREP members develop a shared vision of what is possible in high quality teaching and learning at this level and formulate the start of a research agenda to tackle remaining challenges.