Quality Development in Teacher Education and Training
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Second International GIREP Seminar 2003
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Introduction

This book includes a selection of the contributions presented at the Second International Girep Seminar on Quality Development in Teacher Education and Training, held in Udine in September 2003, with the scientific responsibility of the Groupe International de Recherche sur l’Enseignement de la Physique (GIREP), European Physical Society (EPS) – Division of Education, International Commission on Physics Education of IUPAP (ICPE), European Physics Education Network (EUPEN), American Association of Physics Teachers (AAPT), University of Udine, Italy. The Girep Seminars are an initiative proposed by the writer and they have been held twice at the University of Udine. They represent a completely new way of meeting, with the purpose of exchanging researches, experiences and connected activities at an international level. They have been planned in a way to offer the participants an opportunity to discuss in depth the problems they deal with, as can be understood by the description of the Seminar, found in the last chapter of this volume. The works which the participants offer as a contribution are selected in advance and presented on the first day of the Seminar, so that they can be used in the workshops, meant for the discussion of specific aspects and problems connected to the topic of the Seminar. The participants are also selected to form a number which can realize a working condition in which the discussions on the various topics allow a development in the sharing of the problems. Of the 360 contributions offered, 120 have been chosen for the presentation of the Seminar. This volume contains 80 of them, many of which have been completely revised after the discussions and the referees’ report.

The selection of the papers published in this volume was carried out by a wide group of referees. Each paper was examined by a member of the Executive Editorial Board (EEB), by a member of the Editorial Board and by one or more referees, chosen by the EEB from the experts on the topics.

Chapter 1 includes the works which have given a contribution as an overview on topics related to teacher training, like the general talks of the Seminar. That is, the search for quality, the contributions in this field of research, Information Communication Technology, epistemological and laboratory aspects, ontological problems, peculiarities of the relation between science and technology and the significant experiences of some countries. In this chapter we also included the contribution Physics, Toys and Art, the object of general evening talk.

Chapter 2 is a collection of the Special Aspects discussed in the three round tables, the outcomes of which were sent to the general meeting of the European Ministers of Education and University, held in Berlin at the end of September 2003. A summary of the outcomes of the discussion, edited by the scientific chairpersons of the round tables, has been put at the beginning of each paragraph. The first one is dedicated to the role of Institutions in improving science teaching and the quality of teacher education and training, with contributions from a European scientific society (EPS), from an American one (AAPT), from the research communities, from the teachers who must apply the reforms and from the teacher associations (SAIt). The second one is dedicated to the cooperation between schools and universities, with personal thoughts given by European and American representatives (EPS) of the academic world, with emblematic experiences from Italy and Croatia. The third is dedicated to the contribution given by the journals in teacher education: experiences coming from English, Austrian, Italian scientific journals and the telematic experience of Indire, still unique in Europe for its dimensions, add to the general reflections.

Chapter 3 is articulated in the following 10 paragraphs, which concern the specific aspects selected for the discussion of the Seminar. In each paragraph, the first article concerns the outcomes of the related workshop discussion. Initial teacher training is the first paragraph and it consists of 11 contributions, focused especially
on secondary school teachers and general aspects. However, there are also contributions concerning the change of curricula and the students’ opinion on the quality of the teachers. 

*In-service teacher training* includes two extra contributions and offers an ample spectrum on problems related to inter-institutional cooperation, to the integration of pre-service and in-service training, and to the updating of the curriculum and of the formative models. Innovative experiences are analysed as contributions to a model. The last two contributions concern proposals which are emblematic of content and instruments. 

*Technology in teacher training* offers general contributions, such as the one which explores the potential of computer aided practical work as an agent for innovative change, on the role of computer modelling. Most of the contributions, however, concern examples and experiences presented as a good thing to imitate. 

*Research in teacher training* has half of the contributions dedicated to cognitive problems, to learning problems, to ways of reasoning and of identifying concepts. One concerns a research based on the video recording of class activities. Another focuses on the contribution given by history and philosophy to the initial formation of secondary school teachers. The others concern experimented strategies of pre-service and in-service teacher training. 

*University teachers and their training* is one of the shortest chapters, but this does not make it any less important. The analysis of competences for university physics teachers, the difficulties, the motivations, the training proposals linked to the laboratory, the incentives and the other proposals aimed at improving the quality of university teachers represent an important point of reference for the beginning of a process of training for university teachers which is necessary nowadays. An article also suggests a model for the start of this important task. 

*Primary school teacher training* contains three types of contributions: models and good practices for pre-service and in-service training of primary school teachers, researches on specific aspects and strategies, suggestions for activities. 

*New ways of teaching physics concepts and teacher training* offers contributions of various kinds: one on the linking between university training and teaching practice; five on proposals for modern physics in secondary school, with particular attention to quantum physics; two on special projects for the innovation of contents; three on cultural and professional aspects, motivation, poor formalisation skills, daily life instruments for demonstrations. 

*Multimedia in teacher training* contains six contributions which describe multimedia instruments which are available and have been experimented. 

*Distance teacher training* offers three main types of contributions: analysis of architectures and organizational models for e-learning, experiences and proposals for long-distance training, researches on the strengthening which can derive from blended activities on classroom team-teaching, on the discussion of experiments, on computer conference. 

*Laboratory and ITC in teacher training* contains, apart from a general reflection and the description of an experiment, contributions aimed at presenting emblematic laboratory activities, and most of the times computer on-line measurements based on sensors are proposed. 

Charter 4 is a synthesis of the Seminar. 

The choice of publishing a thematic book has been driven by the need for specialization that emerged in the studies of educational and didactical research and in teacher education. The editorial board and the executive editorial board (EEB) worked in a rigorous way and with dedication to offer a useful tool. I wish to thank all my colleagues who have participated and have helped with their efforts and dedication. A particular thanks goes to Brenda Jennison and Silvia Pugliese Jona. Nonetheless I am thankful to the editorial secretariat, which has assisted me constantly. We apologize for any possible errors that have been made, and we hope that this book can be useful to teachers and colleagues who work in the physics education research and in the field of teacher training.

Marisa Michelini