Contents

Quality in practice-oriented research in science education
(Intentions of the symposium)
Bernd Ralle & Ingo Eilks ................................................................. 1

Quality in Action Research for classroom development
Herbert Altrichter ................................................................................. 5

Chemistry teachers’ beliefs about teaching and learning of chemistry in the context of curriculum innovation in the Netherlands
Jan H. van Driel & Astrid M. W. Bulte ................................................... 17

Changing teachers’ attitudes and professional skills by involving them into projects of curriculum innovation in Germany
Ingo Eilks, Ilka Parchmann, Cornelia Gräsel & Bernd Ralle .................... 29

Transforming educational theory into usable knowledge: A case of co-constructing tools for lesson design and reflection
Fritz S. Staub .......................................................................................... 41

The Cams Hill Science Consortium: An inter-institutional collaborative Action Research project in science education
John K. Gilbert & Matthew Newberry ..................................................... 53

Teachers research their students’ understanding of electrical conductivity
Rachel Mamlok-Naaman, Oshrit Navon, Miriam Carmeli & Avi Hofstein . 63

A teacher researcher group's exploration of chemical equations
John Oversby .......................................................................................... 73

Teaching constructively: Implications and perspectives
Nicos Valanides ....................................................................................... 83

IMST² (Innovations in Mathematics, Science and Technology Teaching) - An inter-universities project to develop science teaching in Austria
Karl Brachtl ............................................................................................. 95
Involving students in meaningful chemistry education by adapting authentic practices
Astrid M.W. Bulte, Hanna B. Westbroek, Lisette van Rens & Albert Pilot 105

Emotional and cognitive aspects of learning: The ecological unit “Lake”
Christoph Randler & Franz X. Bogner .......................................................... 117

From algorithmic LOCS teaching to HOCS learning – A paradigm shift: What does /should it take in practice-oriented research in STES education?
Uri Zoller ...................................................................................................... 125

The role of research in a systemic approach to school development - Experiences from interdisciplinary school projects
Michael Schallies ......................................................................................... 137

Visual tools and science teachers’ professional development
Ani Epitropova .............................................................................................. 147

How student teachers teach difficult ideas in chemistry?
Declan Kennedy & Judith M. Bennett ......................................................... 157

Approaches towards quality in practice-oriented research in science education (Reflections from the symposium)
Ingo Eilks, Bernd Ralle, Albert Pilot & Nicos Valanides ............................... 167

List of participants ......................................................................................... 171