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European Variety in University Chemistry Education

BOOK OF ABSTRACTS

*University Chemistry Education for the Challenges of
Contemporary Society*

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Živoslav Tešić

Edited by
Dragica Trivic
University of Belgrade – Faculty of Chemistry

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Jasmina Arsenijevic Mijalkovic
University of Belgrade – Faculty of Chemistry

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PREFACE

The conference entitled 7th EuroVariety – European Variety in University Chemistry Education has been organized by the University of Belgrade – the Faculty of Chemistry, the Serbian Chemical Society and the EUChemS Division of Chemical Education. The main aim of the Conference is to provide an opportunity to share knowledge and experience relating to the important issues concerning university chemistry and chemical technology education in order to prepare future students to better respond to their personal needs and the needs of the contemporary society and to meet the labour market requirements. Therefore, the conference theme "**University Chemistry Education for the Challenges of Contemporary Society**" points out the need for continuous reconsideration of the connections between BSc, MSc and PhD chemistry studies and the contemporary professional, social and scientific challenges.

Over 70 participants from 29 countries have shared their experiences in their presentations offering their insights, pointing up the challenges and suggesting new solutions regarding the following Conference topics:

- Development of the university curricula for BSc, MSc and PhD chemistry studies
- Competency-based university chemistry education
- Chemistry education through university-industry partnerships
- Laboratory work as an element of problem solving and inquiry-based chemistry education
- Ethical guidelines and university chemistry education for sustainable development
- The use of ICT in chemistry education at the 3rd level
- The role of history of chemistry and philosophy of science in university education
- Cultural heritage and chemistry education
- Development of educational competencies of academic chemistry teachers
- Evaluation of learning outcomes and problems relating to assessment in HEIs
- The contemporary chemistry teachers' education and the long-term professional development of chemistry teachers.

Summaries in this Book of Abstracts deal with the practical aspects of teaching chemistry and research into chemistry education at both undergraduate and postgraduate levels with the aim of enabling students to build key professional and transferable skills needed in order to be successful in a highly competitive labour market and life in the rapidly changing world.

I wish all participants a successful conference and fruitful discussion. I hope you will all enjoy your stay in Belgrade.

Dragica Trivic

Head of the Local Organizing Committee



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PRINCIPLES OF DEVELOPMENT OF A CHEMISTRY UNIT TO VISUALLY IMPAIRED STUDENTS

Mustafa Sozibilir¹, Aydin Kizilaslan¹ and S. Levent Zorluoglu²

¹ Atatürk University, Department of Mathematics & Science Education, Erzurum, Turkey
sozibilir@atauni.edu.tr; aydin.kizilaslan@atauni.edu.tr

² Artvin Çoruh University, Department of Mathematics & Science Education, Erzurum, Turkey
leventzorluoglu@artvin.edu.tr

Science education has been identified by some special educators as a one of the most useful and most valuable content area for many students with special needs. It is obvious that visually impaired students perform as effectively as other students in science if their needs due to lack of vision are taken into consideration.

In this study, we developed an instructional design to teach the concepts regarding matter and heat in the light of the students' individual needs and investigated the efficacy of instructional design model developed following the implementation. The study was conducted as a Design Based Research (DBR) method. DBR is used as a response to the gap between basic and applied research practices. The participants of this activity were eight students, including three blind students.

The study was carried out in three steps. At the first step, visually impaired students' individual needs were identified in terms of scientific process skills and conceptual understanding regarding matter and heat. At the second step of the study, instructional materials (instructor's guide and student handouts), activities and activity materials were designed. Some essential principles such as 'color contrast should be considered in the student handouts and materials should be directed at acquiring cognitive content as well as affective and psychomotor skills' were defined when developing materials. At the last step, the instructional materials and the learning process in terms of appropriateness, effectiveness and competency were evaluated. For this purpose, data gathered through tests and semi-structured interviews were subjected to descriptive analysis to determine the efficiency of instructional design. The average level of achievements corresponding to the instruction in the post-test is found to be 55.5 %.

Keywords: Visually impaired students, Learning chemistry

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