

**EuCheMS**  
European Chemical Sciences



Serbian Chemical Society



University of Belgrade  
Faculty of Chemistry

**7<sup>th</sup> EuroVariety**

**European Variety in University Chemistry Education**

# **BOOK OF ABSTRACTS**

*University Chemistry Education for the Challenges of  
Contemporary Society*

**Belgrade, 28 – 30 June 2017**

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Živoslav Tešić

Edited by  
Dragica Trivic  
University of Belgrade – Faculty of Chemistry

Proofreading by  
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University of Belgrade – Faculty of Chemistry

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## PREFACE

The conference entitled 7<sup>th</sup> 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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## AN INSTRUCTIONAL DESIGN TO TEACH CONCEPTS REGARDING PHASES OF MATTER TO VISUALLY IMPAIRED STUDENTS

Aydin Kizilaslan<sup>1</sup> and Mustafa Sozbilir<sup>1</sup>

<sup>1</sup> Atatürk University, Department of Mathematics & Science Education, Erzurum, Turkey  
aydin.kizilaslan@atauni.edu.tr; sozbilir@atauni.edu.tr

The abstract concepts of science make it difficult for students with visual impairment to learn these concepts. The aim of this study is to investigate the efficacy of designed instruction model on visually impaired students' learning concepts regarding phases of matter. An instructional design was developed by using a design based research method.

The study consists of three basic stages. In the first stage of the study visually impaired students' learning needs for the concepts regarding phases of matter were identified. In the second stage, teaching materials and activities were designed. In the last stage, the applicability, practicability and contributions of these teaching materials and activities to understanding were evaluated.

The sample of this study consists of six visually impaired 8<sup>th</sup> grade students, including one blind. Data were collected through tests, interviews and observations. As a result of data analysis, the learning and achievement levels of students in acquiring the concepts were found to be considerably improved. It has been found that they have learnt most of the concepts related to phases of matter. According to the normalized gain analysis, students' learning achievement level of the concepts was measured to be 68 %. As a result, the instructional design model including teaching activities and materials that are designed according to the needs of the students with visual impairment contribute positively to their academic achievements.

**Keywords:** Visually impaired students, Learning chemistry