



**University of Kragujevac  
Faculty of Technical Sciences Čačak**



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## Preface

Eighth international scientific conference Technics and Informatics in Education – TIE 2020 aims to promote and support research in education of new generations in technical and technological fields at all levels of education and contribute to technology development and education improvement.

Some 64 papers have been submitted within various fields of technical, IT and technology-supported education at all educational levels – primary, secondary, higher education and education for adults. After reviewing, 57 papers were accepted for the current edition of Proceedings in the form of plenary lectures and original scientific papers. Five more papers were accepted to be published in Appendix A of the Proceedings (on Serbian language) for the Symposium “Technics and Informatics in Education: School Teachers for Teachers” that is organized within TIE 2020.

Authors are responsible for any spelling, grammar and stylistic errors in their work.

Articles in the *Proceedings TIE 2020* are organized by the following topics:

- Plenary lectures
- Technics, Technology and Informatics in Education
- Teacher Professional Development and General Education Topics
- IT Education and Practice
- Engineering Education and Practice

Special activities within the Conference are the following:

- Round Table – 45 years of university education of technics and technology teachers in Čačak
- Open discussion and poster-presentation session:
  - Higher Education (HE) development in the realm of technics and technology;
  - Results of HE development projects 2017–2020, programme activities of Ministry of Education, Science and Technological Development (15 projects of the Faculty of Technical Sciences Čačak).

The Scientific and Organizing Committee wishes to express gratitude to all the professionals from various fields who contributed to the Conference.

We would like to thank Partner Institutions which participated as co-organizers of the Conference.

We express special thanks to the Ministry of Education, Science and Technological Development of the Republic of Serbia for financial contribution to this scientific gathering.

*Ivan Milićević*  
Editor

## Chairmen's Foreword

Dear participants,

In the light of on-going, worldwide effects of COVID-19 and following the recommendations of international and national health authorities, Faculty of Technical Sciences Čačak organized the eighth international scientific conference 'Technics and Informatics in Education – TIE 2020' as an ONLINE MEETING. Even though this was completely new experience for the organizing committee, all technical details during the conference went on quite well. The scientific and organizing committees put in all necessary effort to organize the conference in new conditions.

The aim of this conference was to improve the exchange of knowledge and experiences between experts, scientific associates and professionals from Serbia and European countries, engaged in the subject matter. The conference provided an analytical review of technical, technological and IT education, as well as education regarding technical, technological and IT achievements including teaching aids, educational assistive technology, student books, etc.

Serbia already has 50 years long tradition of organizing various forms of seminars, workshops and scientific conferences devoted to improvement of those education topics in primary, secondary and higher education.

A series of conferences, entitled Technics and Informatics in Education, organized by our faculty in last 15 years, exhibit a continuous increase and development in this field, bringing to all of us new education technologies. This assembly continues the tradition of gathering scientific associates and professionals in technical, technological and IT education. Those scientific conferences have a huge impact on the development of technical education in Serbia.

Special focus is on the importance of IT in technical and professional education and correlation with natural, social and education sciences. We hope that experience exchanged during the sessions will be very useful for all participants, and that debate and networking was enjoyable.

The conference results also provide the basis for planning development in technics and informatics education in Serbia, as well as the exchange of educational patterns in the region and coordination with European trends in this field.

**We hope you had a successful and fruitful meeting. Thank you for your participation.**

*Nebojša Mitrović  
Živadin Micić  
Co-Chairs*

## Organization

The 8<sup>th</sup> International Scientific Conference Technics and Informatics in Education - TIE 2020 is organized by the Faculty of Technical Sciences Čačak, University of Kragujevac, Serbia. The Conference is held under the patronage of:

- Ministry of Education, Science and Technological Development of Republic of Serbia
- University of Kragujevac, Faculty of Technical Sciences Čačak, Serbia

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