



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



Proceedings TIE 2022

**9th International Scientific Conference
Technics and Informatics in Education**

Čačak, Serbia, 16-18 September 2022

Book title:

Proceedings TIE 2022

Organizer:

University of Kragujevac, Faculty of Technical Sciences Čačak, Serbia

Co-Organizers:

University of Kragujevac – Erasmus+ Project DigiPsyRes

University of Kragujevac, Faculty of Education in Užice, Serbia

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Sponsors:

Ministry of Education, Science and Technological Development of Republic of Serbia

University of Kragujevac, Faculty of Technical Sciences Čačak, Serbia

University of Kragujevac, ERASMS+ project „Enhancing digital and psychological resilience through peer networking in the online environment in times of crises – DigiPsyRes“, 2021-1-RS01- KA220-HED000032204

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Publisher:

University of Kragujevac, Faculty of Technical Sciences Čačak, Serbia

For Publisher:

Danijela Milošević, PhD, Dean of Faculty of Technical Sciences Čačak, University of Kragujevac, Serbia

Edition:

100 copies

Printed by:

University of Kragujevac, Faculty of Technical Sciences Čačak, Serbia, 2022.

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ISBN: **978-86-7776-262-9**

Preface

Ninth international scientific conference Technics and Informatics in Education – TIE 2022 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.

After double-blind reviewing, 72 papers were accepted for the current edition of Proceedings in the form of plenary lectures and original scientific papers, within various fields of technical, IT and technology- supported education at all educational levels – primary, secondary, higher education and education for adults. Two 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 2022.

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

Articles in the *Proceedings TIE 2022* are organized by the following topics:

- Technics, Technology and Informatics in Education;
- Educational Technology;
- Engineering Education and Practice;
- IT Education and Practice;
- Professional Development and General Education Topics;
- ESP and Technics and Informatics: Challenges and Perspectives;
- Digital and Psychological Resilience.

Special activities within the Conference are the following:

- Tribute to Professor Dragan Golubović – founder of conference and creator of Technics and Informatics education in Serbia;
- Round Table: Digital and psychological resilience support by networking and peer problem solving;
- Open discussion: Education of technics and technology teachers – university–school cooperation.

Within the TIE 2022 conference, a special thematic segment is dedicated to the current ERASMUS+ cooperation partnerships in higher education project "Enhancing digital and psychological resilience through peer networking in the online environment in times of crises – DigiPsyRes" (2021-1-RS01- KA220-HED000032204). This multidisciplinary project deals with the problem of the growing need for psycho-social support in times of crises by enhancing digital and psychological resilience through peer networking in the online environment. The main goal of the project is to build capacities, readiness and procedures to empower students to enhance their digital and psychological resilience. The project is coordinated by the University of Kragujevac (2021-2024) and partner institutions are University in Foggia, Italy, and Kazimierz Wielki University in Bydgoszcz, Poland.

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

Presidents' Foreword

Faculty of Technical Sciences Čačak, University of Kragujevac, has the honour to organize the ninth international scientific conference "Technics and Informatics in Education – TIE 2022".

The Conference follows the tradition of gathering teachers, researchers and professionals engaged in various levels of technical, technological and IT education. Over the past 50 years, these gatherings have been organized in numerous forms (conferences, seminars, consultations, etc.) in Serbia and the region. From 2006 to 2016 the conference Technics and Informatics in Education – TIE was organised biennially at the Faculty of Technical Sciences as a national conference with international participation. As of 2018 TIE has a form of an international conference. Eight conferences titled Technics and Informatics in Education were held from 2006 to 2020. The TIE conferences have had a huge impact on the development of IT, technical and scientific subjects in both primary and secondary education. The significant impact has also been perceived in diverse fields related to technical and IT education at university level. However, the new circumstances necessitate organising scientific assemblies in the field of technics and the related technologies.

The TIE 2022 conference aims to improve the exchange of knowledge and experience between experts, professionals, researchers and teachers from Serbia and the region. The conference is expected to provide an analytical review of technical, technological and IT education, focusing on teacher training, terminology in the related fields, as well as the achievements regarding teaching aids, student books, educational assistive technology, technology supporting the enhancement of mental health and well-being, etc.

The Conference involves all the levels of technical, technological and IT education: from preschool institutions, primary and secondary schools over higher and university education, to various forms of lifelong learning.

Furthermore, the special emphasis is given to the importance and role of informatics and computer science in technical education, as well as the correlation between technical education and other natural, social and education sciences. The thematic field of ESP, encompassing foreign/second and professional languages in the realm of technics, technology and informatics, is the new aspect of the Conference.

Within the TIE 2022 conference, a special thematic segment will be dedicated to the current ERASMUS+ project which is realized under the section strategic partnerships in higher education and is run by the University of Kragujevac (2021-2024). Project activities within the conference propose a round table, a symposium, and a workshop addressing the issue of the psychological and social resilience of students in times of crisis.

The results of the conference are anticipated to contribute to planning the development of education in the fields of technics, technology, engineering, IT and computer sciences. The results are also expected to support the exchange of educational patterns and the alignment with regional, EU and global trends in fields in the focus.

We hope that experience gained at the Conference will be very useful both for the participants and for the development of technical-technological education field.

Presidents of the Scientific Committee and Organizing Committee

Organization

The 9th International Scientific Conference Technics and Informatics in Education - TIE 2022 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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