E-learning and STEM Education
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INTRODUCTION

The theme of the conference is: *"E-learning and STEM Education*".
"Skills in Science, Technology, Engineering and Mathematics (STEM) are becoming an increasingly important part of basic literacy in today's knowledge economy. To keep Europe growing, we will need one million additional researchers by 2020." (http://www.eun.org/focus-areas/stem)

The monograph *"**E-learning and STEM Education**"* includes articles based on the best papers prepared and presented by authors from nine European countries and from more than twenty universities during the 11th Annual International Scientific Conference "**Theoretical and Practical Aspects of Distance Learning**", subtitled: "***E-learning and STEM Education***", which was held on 14-15 October 2019, organized by the Faculty of Ethnology and Sciences of Education in Cieszyn, University of Silesia in Katowice, Poland.

Experts on STEM and robotics in education from 10 countries, in particular Austria, Bulgaria, Czech Republic, Morocco, the Netherlands, Poland, Slovakia, Ukraine, Russia, Turkey reflect on how STEM education is currently viewed and implemented in their country, drawing on the legislation and funding focus and using local data to predict how the future will unfold for STEM education.

The speakers from the University of Innsbruck (Austria), University of Twente (the Netherlands), the Comenius University in Bratislava (Slovakia), Plovdiv University "Paisii Hilendarski" (Bulgaria), Borys Grinchenko Kyiv University (Ukraine), Gdańsk Technical University (Poland), Herzen State Pedagogical University of Russia, St. Petersburg (Russia), Jagiellonian University (Poland), Warsaw University (Poland), Silesian University in Opava (Czech Republic), Jesuit University of Philosophy and Education "Ignatianum", Cracow, (Poland), University of Silesia in Katowice (Poland), University of Defence in Brno (Czech Republic), K. Ushynskyi South Ukrainian National Pedagogical University (Ukraine), Maria Curie-Skłodowska University in Lublin (Poland), Lublin University of Technology (Poland), Mykhailo Drahomanov National Pedagogical University, Kyiv, (Ukraine), Kazimierz Wielki University in Bydgoszcz (Poland), Taras Shevchenko National University "Chernihiv Collegium" (Ukraine), Dniprovsk State Technical University (Ukraine), University of Ostrava (Czech Republic), Pedagogical University of Krakow (Poland), University of Social Sciences and Humanities in Warsaw (Poland), Makarenko Sumy State Pedagogical University (Ukraine), Poznań University of Medical Sciences (Poland), Ternopil

University (Ukraine), Kherson State University (Ukraine), Warsaw University of Technology(Poland), University of Social Sciences and Humanities in Warsaw (Poland), Izmail State University of Humanities (Ukraine), Adam Mickiewicz University in Poznań, (Poland), and other educational institutions delivered lectures providing insights into interesting studies, presented their recent research results and discussed their further scientific work.
The authors include experts, well-known scholars, young researchers, highly trained academic lecturers with long experience in the field of e-learning, PhD students, distance course developers, authors of multimedia teaching materials, designers of websites and educational sites.

I am convinced that this monograph will be an interesting and valuable publication, describing the theoretical, methodological and practical issues in the field of E-learning in STEM education offering proposals of solutions to certain important problems and showing the road to further work in this field, allowing exchange of experiences of scholars from various universities from many European countries and other countries of the world.

This book includes a sequence of responses to numerous questions that have not been answered yet. The papers of the authors included in the monograph are an attempt at providing such answers. The aspects and problems discussed in the materials include the following:

1. E-learning and STEM Education

- STEM education trends
- Robots and coding in education.
- Immersive learning environments. Blockchain.
- Internet of things. 3D printing

2. E-environment and Cyberspace

- E-environment of the University.
- SMART-Universities. SMART Technology in education
- E-learning in a sustainable society.

3. E-learning in the Development of Key and soft Competences:

- Effective development of teachers; skills in the area of ICT and e-learning
- Key competences in the knowledge society,
- Use of e-learning in improving the level of students' digital competences,
- Distance Learning and Lifelong Learning
- Self-learning based on Internet technology

4. E-learning and Intercultural Competences Development in Different Countries:

- Legal, social, human, scientific, technical aspects of distance learning and e-learning in different countries,
- Psychological and ethical aspects of distance learning and e-learning in different countries,
- Collaborative learning in e-learning,

5. E-learning Methodology – Implementation and Evaluation:

- European and national standards of e-learning quality evaluation,
- Evaluation of synchronous and asynchronous teaching and learning, methodology and good examples,
- MOOCs – methodology of design, conducting, implementation and evaluation,
- Contemporary trends in world education – globalization, internationalization, mobility.

6. ICT Tools – Effective Use in Education:

- Selected Web 2.0 and Web 3.0 technology,
- LMS, CMS, VSCR, SSA, CSA,
- Cloud computing environment, social media, Multimedia resources Video-tutorial design.

7. Alternative Methods, Forms and Techniques in Distance Learning:

- simulations, models in distance learning,
- networking, distance learning systems,
- m-learning.

8. Theoretical, Methodological Aspects of Distance Learning:

- Successful examples of e-learning,
- Distance learning in humanities and science,
- Quality of teaching, training programs and assessment,
- E-learning for the disabled.

Publishing this monograph is a good example of expanding and strengthening international cooperation. I am very grateful for valuable remarks and suggestions which contributed to the quality of the publication. Here I especially want to thank Ryszard Kalamarz, Andrzej Szczurek and Dominika Zegzuła for their assistance in editing this publication. Also, I would like to say 'thank you' to the authors for the preparation and permission to publish their articles. I wish all readers a pleasant read. Thank you.

Eugenia Smyrnova-Trybulska