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**ALAN ROGERSON AND JANINA MORSKA  
(EDITORS)**

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THE FUTURE PROJECT**

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THEORY AND PRACTICE: AN INTERFACE OR  
A GREAT DIVIDE?**

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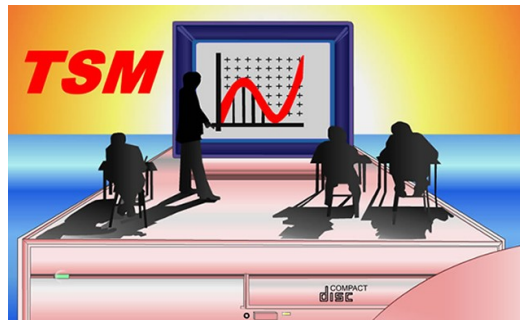
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- Our Project Home Page: <http://math.unipa.it/~grim/21project.htm> has the proceedings of previous conferences from Egypt 1999 to Dresden 2009.
- Andreas Filler at <http://www.afiller.de/charlotte07> has a photo album of our Charlotte Conference in 2007.
- For recent conference links please email [alan@cdnalma.poznan.pl](mailto:alan@cdnalma.poznan.pl)

## Foreword

This volume contains the papers presented at the International Conference: ***Theory and Practice: An Interface or A Great Divide?*** held from 4-9 August, 2019 at Maynooth University, Kildare, Ireland.

The Conference was organized by The Mathematics Education for the Future Project - an international educational project founded in 1986 and dedicated to the improvement of mathematics education through the publication and dissemination of innovative ideas. Many prominent mathematics educators have supported the project in the past including: Hans Freudenthal, Andrejs Dunkels, Hilary Shuard, Bruce Meserve, Marilyn Suydam, Alan Osborne, Margaret Kasten, Mogens Niss, Tibor Nemetz, Ubi D'Ambrosio, Brian Wilson, Tatsuro Miwa, Henry Pollack, Werner Blum, Roberto Baldino, Wacław Zawadowski.

### **Deserving Scholars and Researchers Programme**

For the fourth time in our conferences deserving scholars were invited to submit papers for peer review and publication in the proceedings even though they were unable to attend the conference itself. Instead, their papers were included in the conference programme and were briefly presented by others. The papers in Maynooth were those by: Dr. Maifer Remzie Demirbec, Bernie (Dov) May and Dr. Esther Pearson. Since we will not meet these authors face to face in Ireland we have included their photographs and short CVs at the end of these Proceedings and in the permanent Ireland Conference Documents webpage.

We sincerely thank all of the contributors to the conference for their time and creative effort. It is clear from the variety and quality of the papers that the conference has attracted many innovative mathematics educators from around the world.

We are especially grateful to Professor Martin Stein of Münster University, the Owner and Manager of the company that publishes these printed proceedings: WTM-Verlag (Wissenschaftliche Texte und Medien – scientific texts & media).

These Proceedings begin with the Plenary Paper and Workshops by Douglas Butler, followed by a contents list and then the papers & workshop summaries in alphabetical order of the principal authors.

**Dr. Alan Rogerson**

**D.Phil (Oxon), M.Sc., B.Sc., B.A. (Lon), Dip.Ed., Cert. Ed. (Cantab).**

**Chairman of the IPC and Co-ordinator of the Mathematics Education for the Future Project**

## **Plenary Keynote Address: Can Technology make a Difference to Mathematics Education?**

Douglas Butler

iCT Training Centre, Oundle UK

[debutler@argonet.co.uk](mailto:debutler@argonet.co.uk)

Douglas has followed the introduction of technology in the mathematics classroom from the start in the 80s to where we are today. There is now a massive spectrum of wonderfully sophisticated tools to help make mathematics lessons shine for today's inter-connected students. The possibilities are endless, and with A.I. just around the corner ... yet the majority of mathematics teachers are not using digital resources at all. This session, and the two workshops to follow, will attempt to answer this by referring to research in this area, and by showing some spectacular lesson plans in which the technology does not get in the way, and the mathematics shines through.

### **Workshop 1: Helping Statistical Education through Visualisation**

Statistics is rapidly being adopted as a major section of school syllabuses. This workshop will start by showing where to find thought-provoking large data sets. Douglas will then show how the latest incarnation of Autograph makes light work of the analysis and helps students to make sense of what's going on by the use of dynamic visualisations.

### **Workshop 2. Exploring Concepts through a Friendly User-interface.**

There are now three major players in graphing technology for mathematics education. They are, in order of seniority: Autograph, Geogebra and Desmos. Each has their strengths. This workshop aims to illustrate how the user-interface of the latest incarnation of Autograph has been designed particularly with the pedagogical process of teaching and learning at the forefront.

Douglas Butler has enjoyed a full life in mathematics education, as a teacher, head of department, chairman of MEI, organiser of TSM Workshops for over 25 years, and he has spearheaded the continued development of the ever

popular software Autograph. When not doing any of this he enjoys sailing his Wayfarer, and conducting the Rusty Strings of Oundle!

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