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IFIP was founded in 1960 under the auspices of UNESCO, following the first World Computer Congress held in Paris the previous year. A federation for societies working in information processing, IFIP's aim is two-fold: to support information processing in the countries of its members and to encourage technology transfer to developing nations. As its mission statement clearly states:

> *IFIP is the global non-profit federation of societies of ICT professionals that aims at achieving a worldwide professional and socially responsible development and application of information and communication technologies.*

IFIP is a non-profit-making organization, run almost solely by 2500 volunteers. It operates through a number of technical committees and working groups, which organize events and publications. IFIP's events range from large international open conferences to working conferences and local seminars.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is generally smaller and occasionally by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

IFIP distinguishes three types of institutional membership: Country Representative Members, Members at Large, and Associate Members. The type of organization that can apply for membership is a wide variety and includes national or international societies of individual computer scientists/ICT professionals, associations or federations of such societies, government institutions/government related organizations, national or international research institutes or consortia, universities, academies of sciences, companies, national or international associations or federations of companies.

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Torsten Brinda · Don Passey ·
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Empowering Teaching for Digital Equity and Agency

IFIP TC 3 Open Conference on Computers in Education, OCCE 2020
Mumbai, India, January 6–8, 2020
Proceedings

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Preface

This volume contains selected papers from the Open Conference on Computers in Education (OCCE 2020), organized by Technical Committee 3: Education (TC3) and its working groups. The conference was held in Mumbai, India, during January 6–8, 2020, and was hosted and supported by the Tata Institute of Social Sciences and the India Didactics Association. OCCE 2020 was open to researchers, policy makers, educators, and practitioners worldwide. The conference title, which has also been selected as the book title, *Empowering Teaching for Digital Equity and Agency*, reflects the ongoing commitment to and current interests in research and practice in learning and technology that members of TC3 and its working groups have fostered over many years, and continue to nurture today. Submissions to the conference were invited to address the following eight key themes:

- Teacher Empowerment, Training and Professional Development with Information and Communications Technology (ICT)
- Computing and Computer Science Education
- Digital Equity and Agency
- Developing Uses of Technologies in Informal and Formal Learning Situations
- Developing Effective Teaching Practices and Pedagogies
- Inclusive Technologies, Adaptive Technologies and Accessibility
- ICT Interventions and Scalability
- Open Educational Resources (Design, Evaluation, Sharing)

Altogether, 57 submissions of full and short papers, symposia, industry foresights, learner and teacher presentations, and system presentations were received and reviewed by an International Program Committee and additional reviewers in a double-blind peer-review process. Among these submissions were 47 full and short papers, from which 15 were accepted for publication in the volume at hand. The overall acceptance rate was 31.9%. Each one of these papers was reviewed by at least three reviewers. The papers in this book arise from contributions from (in alphabetical order) Australia, Austria, Denmark, Finland, Germany, India, Ireland, Japan, and the UK, which reflects the conference's success in bringing together and networking experts from many countries worldwide.

The book is structured into five topical sections. The first section focuses on aspects of "Computing Education" at school level – an important facet in the process of developing digital agency among school learners. In this section, you will find practical approaches and examples as well as a theoretical framework. Micheuz reports on the important and current topic of artificial intelligence and provides an overview of relevant initiatives and approaches for school education. Weigend combines aspects of learning with digital technologies and about digitization in the classroom by presenting examples of an introduction to programming using a variety of digital media. Nayak, Keane, and Seeman describe a conceptual framework based on technacy theory with

the potential to form a working model for teachers teaching computer science/digital technologies in K-12 classrooms.

The second section is about "Learners' and Teachers' Perspectives," which address important concerns when designing learning and teaching processes for digital equity and agency. In this section, you will find papers about learners' and teachers' conceptions developed in classrooms, through everyday experiences and in teacher education programs. Hillier, Kumar, and Wijenayake investigate the impact of technology problems on students' perceptions of computerized examination technologies and procedures. Keil, Batur, Kramer, and Brinda report on upper-secondary school students' images of computer scientists. Butler and Leahy describe pre-service primary school teachers' understandings of computational thinking after having completed a course in digital learning. Hayes reports on an early exploration of gender imbalance in computing, by analyzing trainee teachers' images of computing classrooms.

The third section covers "Teacher Professional Development." In this section, you will find papers about the development of professional and digital agency of teachers. Paltiwale, Sarkar, and Charania provide a descriptive analysis of a community of practice of teachers, which was enabled by the use of digital technologies in rural India. Misquitta and Joshi report on how Universal Design of Learning can be implemented in an Indian context based on outcome data of a six-month professional development program. Andresen presents results of a case study exploring design and certification of e-learning courses with a focus on the professional agency of teachers.

The fourth section contains papers that take "The Industry Perspective" and focus on the information technology (IT) industry's need for engaging a workforce with professional digital agency. The papers in this section cover two aspects: alignment of IT curricula and industry needs; and conclusions to be drawn from female career paths into the IT industry with regard to education in this field. Garscha and Wöhrer report on their findings concerning the question, whether cloud computing is adequately dealt with in the IT curricula of Austrian universities according to the requirements of the IT labor market. Hyrynsalmi, Islam, and Ruohonen analyze the stories of 23 women who were working in the ICT industry to learn more about the motivation, challenges, and best practices for different career paths that can lead to working in the IT industry.

The fifth and final part of the book on "Further Aspects" contains three more papers. Fluck analyzed the terms and conditions of 48 online services and discusses the estimated professional cost of their perusal with regard to the use of such services by teachers in the classroom. Shiozawa, Hoenigman, and Matsuzawa developed a tool to visualize the course selection in interdisciplinary study programs such as social informatics and report first findings of its application. Aoki, Sakka, Emi, Kobayashi, and Okamoto report on the results of a text data analysis on answers written in Japanese to free text questions obtained at astronomical lectures using co-occurrence network diagrams.

The editors offer leading-edge work through this choice of papers that they hope will be of interest to further inspire your own work.

August 2020

Torsten Brinda
Don Passey
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