

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board Members

David Hutchison

Lancaster University, Lancaster, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Friedemann Mattern

ETH Zurich, Zurich, Switzerland

John C. Mitchell

Stanford University, Stanford, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

C. Pandu Rangan

Indian Institute of Technology Madras, Chennai, India

Bernhard Steffen

TU Dortmund University, Dortmund, Germany

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

More information about this series at <http://www.springer.com/series/7407>

Simon K. S. Cheung · Lap-Kei Lee ·
Ivana Simonova · Tomas Kozel ·
Lam-For Kwok (Eds.)

Blended Learning

Educational Innovation for Personalized Learning

12th International Conference, ICBL 2019
Hradec Kralove, Czech Republic, July 2–4, 2019
Proceedings

Editors

Simon K. S. Cheung
The Open University of Hong Kong
Hong Kong, China

Ivana Simonova
Jan Evangelista Purkyně University
Ústí nad Labem, Czech Republic

Lam-For Kwok
City University of Hong Kong
Hong Kong, China

Lap-Kei Lee
The Open University of Hong Kong
Hong Kong, China

Tomas Kozel
University of Hradec Kralove
Hradec Kralove, Czech Republic

ISSN 0302-9743

ISSN 1611-3349 (electronic)

Lecture Notes in Computer Science

ISBN 978-3-030-21561-3

ISBN 978-3-030-21562-0 (eBook)

<https://doi.org/10.1007/978-3-030-21562-0>

LNCS Sublibrary: SL1 – Theoretical Computer Science and General Issues

© Springer Nature Switzerland AG 2019

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

Welcome to the proceedings of the 12th International Conference on Blended Learning (ICBL 2019). This year, ICBL 2019 was held at the University of Hradec Kralove in Hradec Kralove, Czech Republic, during July 2–4, 2019.

Blended learning is one of the promising approaches to teaching and learning. It integrates traditional learning with innovative means to create a new learning environment conducive to effective learning. Like the previous conferences in the series, ICBL 2019 provided a platform for knowledge exchange and experience sharing among researchers and practitioners in this field.

The theme of ICBL 2019 was “Educational Innovation for Personalized Learning.” Our focus was on new and innovative practices of blended learning that can enable personalized learning, enhance learning effectiveness, and enrich the learning experience. ICBL 2019 attracted a total of 80 paper submissions. After a rigorous review process, 28 papers were selected for inclusion in this volume. The selected papers cover various areas in blended learning, including personalized learning, adaptive learning, content development, analytics and evaluation for blended learning, experience in blended learning, open educational resources, and pedagogical and psychological issues.

We would like to take this opportunity to thank the following parties who made the conference a success: (a) the conference Organizing Committee; (b) the International Program Committee; (c) the conference organizers and co-organizer; (d) the conference sponsors, and (e) all the conference participants.

We trust you will enjoy reading the papers.

July 2019

Simon K. S. Cheung
Lap-Kei Lee
Ivana Simonova
Tomas Kozel
Lam-For Kwok

Organization

Organizing Committee

Honorary Chairs

Horace H. S. Ip	City University of Hong Kong, SAR China
Kamil Kuca	University of Hradec Kralove, Czech Republic

Conference Chairs

Lam-For Kwok	City University of Hong Kong, SAR China
Petra Poulova	University of Hradec Kralove, Czech Republic

Program Chairs

Simon K. S. Cheung	The Open University of Hong Kong, SAR China
Lap-Kei Lee	The Open University of Hong Kong, SAR China
Ivana Simonova	Jan Evangelista Purkyne University, Czech Republic
Tomas Kozel	University of Hradec Kralove, Czech Republic

Organizing Chairs

John Hui	Education University of Hong Kong, SAR China
Miloslava Cerna	University of Hradec Kralove, Czech Republic

Finance and Registration Chairs

Steven Ng	University of Sunderland, UK
Hana Sramkova	University of Hradec Kralove, Czech Republic

Publicity Chairs

Jana Rubackova	University of Hradec Kralove, Czech Republic
Kristyna Jandova	University of Hradec Kralove, Czech Republic
Morris Jong	The Chinese University of Hong Kong, SAR China
Yinghui Shi	Central China Normal University, China

Web Masters

Richard Li	City University of Hong Kong, SAR China
Vera Palanova	University of Hradec Kralove, Czech Republic

Program Committee

Chairs

Simon K. S. Cheung	The Open University of Hong Kong, SAR China
Lap-Kei Lee	The Open University of Hong Kong, SAR China
Ivana Simonova	Jan Evangelista Purkyně University, Czech Republic
Tomas Kozel	University of Hradec Kralove, Czech Republic

Members

Oliver Au	The Open University of Hong Kong, SAR China
Jan Beseda	Centre for Higher Education Studies, Prague, Czech Republic
Pavel Brebera	University of Pardubice, Czech Republic
Jana Burgerova	University of Presov, Slovakia
Jinnong Cao	The Hong Kong Polytechnic University, SAR China
C. S. Chai	The Chinese University of Hong Kong, SAR China
Keith Chan	The Hong Kong Polytechnic University, SAR China
Peter Chan	Brigham Young University, USA
Chih-Tsan Chang	National Chung Cheng University, Taiwan, China
Wei Chen	Chinese Academy of Agricultural Sciences, China
Guo-Li Chiou	National Taiwan Normal University, China
Giuliana Dettori	Istituto di Tecnologie Didattiche del CNR, Italy
Ludvík Eger	University of West Bohemia, Czech Republic
Zbynek Filipi	University of West Bohemia, Czech Republic
Rostislav Fojtík	University of Ostrava, Czech Republic
Yoshiko Goda	Kumamoto University, Japan
Radomira Greganova	Slovak University of Agriculture, Slovakia
Owen Hall Jr.	Pepperdine University, USA
Andreas Henrich	University of Bamberg, Germany
Dagmar Hillova	Slovak University of Agriculture, Slovakia
Yoko Hirata	Hokkai-Gakuen University, Japan
Yoshihiro Hirata	Hokkai-Gakuen University, Japan
Wai Shing Ho	Caritas Institute of Higher Education, Hong Kong, SAR China
Norio Hosaki	Waseda University, Japan
Jenq-Muh Hsu	National Chiayi University, Taiwan, China
Ronghuia Huang	Beijing Normal University, China
John Hui	Education University of Hong Kong, SAR China
Josef Hynek	University of Hradec Kralove, Czech Republic
Geng Jie	The Chinese University of Hong Kong, SAR China
Morris Jong	The Chinese University of Hong Kong, SAR China
Jacky Keung	City University of Hong Kong, SAR China
Blanka Klimova	University of Hradec Kralove, Czech Republic
Reggie Kwan	The Open University of Hong Kong, SAR China
Lam-For Kwok	City University of Hong Kong, SAR China

Chiu Lin Lai	National Taiwan University of Science and Technology, Taiwan, China
Ivan Lai	City University of Macau, SAR China
Jeanne Lam	University of Hong Kong, SAR China
Jun Le	Guangdong Radio and TV University, China
Min Hsien Lee	National Taiwan Normal University, Taiwan, China
Victor Lee	City University of Hong Kong, SAR China
K. C. Li	The Open University of Hong Kong, SAR China
Yan Li	Zhejiang University, China
Yi Li	Nanjing University, China
Heng Luo	Central China Normal University, China
Will Ma	Technological and Higher Education Institute of Hong Kong, SAR China
Jason MacLeod	Central China Normal University, China
Martina Manenova	University of Hradec Kralove, Czech Republic
Jaroslava Mikulecka	University of Hradec Kralove, Czech Republic
Kousuke Mouri	Kyushu University, Japan
Masayuki Murakami	Kyoto University of Foreign studies, Japan
Junko Nemoto	Ehime University, Japan
Steven Ng	University of Sunderland in Hong Kong, SAR China
Diana Perez-Marin	Universidad Rey Juan Carlos, Spain
C. K. Poon	Caritas Institute of Higher Education, SAR China
Linda Pospíšilová	University of Pardubice, Czech Republic
Petra Poulova	University of Hradec Kralove, Czech Republic
Yanghui Rao	Sun Yat-sen University, China
Lucie Rohlikova	University of West Bohemia, Czech Republic
Junjie Shang	Peking University, China
Yinghui Shi	Central China Normal University, China
Ju Ling Shih	National University of Tainan, Taiwan, China
Raymond So	The Open University of Hong Kong, SAR China
Yanjie Song	Education University of Hong Kong, SAR China
Niwat Srisawasdi	Khon Kaen University, Thailand
Liana Stanescu	University of Craiova, Romania
Cai Su	Beijing Normal University, China
Hana Svobodova	Masaryk University, Czech Republic
Libuse Svobodova	University of Hradec Kralove, Czech Republic
Jeff Tang	The Open University of Hong Kong, SAR China
Jay Tashiro	University of Ontario Institute of Technology, Canada
Jumpei Tokito	Kwansei Gakuin University, Japan
Shikui Tu	Shanghai Jiao Tong University, China
Olga Vrstilova	University of Hradec Kralove, Czech Republic
Aihua Wang	Peking University, China
Cong Wang	City University of Hong Kong, SAR China
Fu Lee Wang	The Open University of Hong Kong, SAR China
Shu Ming Wang	Chinese Culture University, Taiwan, China
Shudong Wang	Shimane University, Japan

Billy Wong	The Open University of Hong Kong, SAR China
Crusher Wong	City University of Hong Kong, SAR China
Gary Wong	University of Hong Kong, SAR China
Raymond Wong	City University of Hong Kong, SAR China
T. L. Wong	Douglas College, Canada
Di Wu	Central China Normal University, China
Haoran Xie	Education University of Hong Kong, SAR China
You Ru Xie	South China Normal University, China
Toshiyuki Yamamoto	Kansai University, Japan
Harrison Yang	State University of New York at Oswego, USA
Y. T. Yu	City University of Hong Kong, SAR China
Tomáš Zeman	Masaryk University, Czech Republic
Liming Zhang	University of Macau, SAR China
Guodong Zhao	Peking University, China
Jianhua Zhao	South China Normal University, China
Yunxiang Zheng	South China Normal University, China
Ying Zhou	Beijing Normal University, China
Sha Zhu	Central China Normal University, China

Organizers



University of Hradec Kralove



City University of Hong Kong

Co-organizer



Hong Kong Society for Multimedia and Image Computing

Sponsors



香港培華教育基金會
Hong Kong Pei Hua Education Foundation

Hong Kong Pei Hua Education Foundation



Springer

Springer Science+Business Media

Keynote Speakers and Panel Chairs

Keynote Speakers

Andrea Benn	University of Brighton, UK
Harrison Yang	State University of New York at Oswego, USA
Shengquan Yu	Beijing Normal University, China
Miloslava Cerna	University of Hradec Kralove, Czech Republic

Panel Chairs

Horace H. S. Ip	City University of Hong Kong, SAR China
Naraphorn Paoprasert	Kasetsart University, Thailand

Contents

Keynotes

Pedagogic Practice in Blended-Learning.	3
<i>Andrea Benn</i>	
Understanding Undergraduates' Adoption of Flipped Learning: Integrating UTAUT and Social Presence	9
<i>Jin Cai, Harrison Hao Yang, and Di Gong</i>	
Double Helix Deep Learning Model Based on Learning Cell	22
<i>Shengquan Yu, Jinju Duan, and Jingjing Cui</i>	
Johann Amos Comenius and His Legacy at the Information Age	46
<i>Miloslava Černá</i>	

Personalized and Adaptive Learning

An Adaptive Blended Learning Health Education Model for Families of a Parent with Serious Medical Problems	59
<i>Jayshiro Tashiro and Anders Hebel</i>	
How Learning Has Been Personalised: A Review of Literature from 2009 to 2018	72
<i>Kam Cheong Li and Billy Tak-Ming Wong</i>	
A Personalized Task Recommendation System for Vocabulary Learning Based on Readability and Diversity	82
<i>Haoran Xie, Minhong Wang, Di Zou, and Fu Lee Wang</i>	
A Design Framework of Virtual Reality Enabled Experiential Learning for Children with Autism Spectrum Disorder	93
<i>Chen Li, Horace Ho Shing Ip, and Po Ke Ma</i>	

Content Development for Blended Learning

The Preference of Electronic, or Printed Materials Revisited.	105
<i>Ivana Simonova</i>	
Summarization Exercises and Interpreting Performance in Blended Interpreting Training	117
<i>Yinghui Li and Hengbin Yan</i>	

Hotel Process Simulator	128
<i>Petra Poulova, Miloslava Cerna, Jana Hamtilova, Filip Malý, Tomáš Kozel, Pavel Kriz, Jan Han, and Zdenek Ulrych</i>	
Adaptive Content Development for Blended Learning in Microscopic of Herbal Medicines	137
<i>Bunyapa Wangwattana and Verayuth Lertnattee</i>	
Experience in Blended Learning	
Lecture Recordings at the University – Analysis and Evaluation of Implementation Possibilities	151
<i>Tobias Hirmer and Andreas Henrich</i>	
ICT in Special Educational Needs Schools from Teachers’ Perspective: A Survey	164
<i>Vojtech Gybas, Katerina Kostolanyova, and Ivana Simonova</i>	
Learning Style Preferences and Blended Learning Approach on Secondary Technical School Level	174
<i>Irena Loudova and Dagmar El-Hmoudova</i>	
Teacher’s Developmental Stages of Exploring Thinking Tools in a Blended Learning Environment	186
<i>Xiao Hong Zhang, Kenichi Kubota, Mayumi Kubota, and Kedong Li</i>	
Analytics and Evaluation for Blended Learning	
The Analysis of Online Learning Behavior of the Students with Poor Academic Performance in Mathematics and Individual Help Strategies	205
<i>Jiyou Jia and Jingrong Zhang</i>	
Mobile Blended Learning and Evaluation of Its Effectiveness on Students’ Learning Achievement	216
<i>Blanka Klímová and Pavel Pražák</i>	
Data Analysis Model of Wearable Devices in Physical Education	225
<i>Qian Dong, Ximei Qu, and Rong Miao</i>	
Research on the Hotspots and Trends of Learning Analytics Based on CiteSpace	239
<i>Yinghui Shi, Shimeng Wang, Yanqiong Ma, Jason Macleod, Min Chen, and Harrison Hao Yang</i>	

Open Educational Resources

Promoting High-Quality Teachers Resource Sharing and Rural Small Schools Development in the Support of Informational Technology	251
<i>Mingzhang Zuo, Wenqian Wang, and Yang Yang</i>	
An Empirical Study on the Usefulness, Effectiveness and Practicability of Vocational and Professional Education and Training's (VPET) Open Educational Resources (OER) in the Hotel Industry.	265
<i>Ricky Yuk-kwan Ng, Kwan-Keung Ng, and Brian Liu</i>	
Study on the Instructional Design of a STEAM Course with Chinese Characteristics – Take “Making Handmade Wood-Burning Ceramic Cups” as a Case	277
<i>Liuhui Huang, Yangyang Han, Kedong Li, Yunxiang Zheng, and Lihong Liu</i>	
Diagnostic Evaluation of MOOCs Based on Learner Reviews: The Analytic Hierarchy Process (AHP) Approach.	289
<i>Yanjiao Nie and Heng Luo</i>	

Pedagogical and Psychological Issues

Use of Fitness Trackers in Fitness Running Classes to Enhance Students' Motivation	303
<i>David Chaloupský, Dagmar Hrušová, and Pavlína Chaloupská</i>	
A Study on Acceptance of Educational Games for the Students in the Stage of Compulsory Education.	316
<i>Yu Jiang, Yongle Zhao, Ying He, Lizhen Jiao, and Ximei Qu</i>	
A Study of Primary School Pupils' Motivation, Emotional Intelligence and Attentional Control Ability.	327
<i>Ruonan Hu, Junjie Shang, and Qi Xia</i>	
Learning Computational Thinking Through Gamification and Collaborative Learning.	339
<i>Lap-Kei Lee, Tsz-Kin Cheung, Lok-Tin Ho, Wai-Hang Yiu, and Nga-In Wu</i>	
Author Index	351