

ICOIE2020

International Conference on Open and Innovative Education



PROGRAMME & ABSTRACTS OF PAPERS 2-4 July 2020

Organizer:



政府創辦·多元創新

Government established · Diversified and innovative



開放及創新教育研究所
Institute for Research in
Open and Innovative Education

Co-organizer:



Contents

Message from the President, the Open University of Hong Kong	2
Message from the President, the Open University of China	3
Message from the Chair, Conference Organizing Committee	4
Committees	5
About the Conference	6
Programme	
2 July 2020: Programme Day 1	7
3 July 2020: Programme Day 2	8
4 July 2020: Programme Day 3	9
Parallel Paper Presentations Day 1	10
Parallel Paper Presentations Day 2	11
Parallel Paper Presentations Day 3	15
Keynote Sessions	16
Conference Workshop	21
Abstracts of Papers	22
Acknowledgment	57

The organizer reserves the right to amend the programme as and when necessary.

Message from the President, The Open University of Hong Kong



Prof. Yuk-Shan Wong
President
The Open University of Hong Kong

It is an honour and my great pleasure to welcome you to the 2020 International Conference on Open and Innovative Education (ICOIE). I am delighted that we have a distinguished partner, the Open University of China (OUC) – the largest and most reputable open and distance learning provider in China – to co-organise this year’s conference with us. It is my sincere hope that you are all keeping safe and well during this global pandemic. Building on the strengths of previous years, this seventh annual conference promises to be a great success and one that encourages valuable knowledge exchange and collaboration.

The field of open and innovative education is evolving, with new ideas and technologies emerging from time to time that enrich and transform our educational offerings. As educational providers, it is vital that we keep up-to-date with the latest developments, as well as identify new ways to advance our educational delivery. With over 30 years of experience, the Open University of Hong Kong (OUHK) has evolved from primarily a distance-learning institution to become a full-fledged university providing a broad range of undergraduate and postgraduate programmes in face-to-face, e-learning, distance, and blended learning modes. As a multi-mode university, we have been using innovative teaching approaches and education technologies to offer quality education. In line with the OUHK’s mission, we strive to make the ICOIE the ideal platform to exchange the latest research and practices with participants from around the globe. The partnership with the OUC in co-organising the event highlights the success of our efforts in this regard.

The topics covered in this year’s ICOIE have received increasing attention of late. In particular, emerging educational technologies, such as learning analytics, artificial intelligence, and virtual and augmented reality, have been widely recognised as having a significant impact on changing the modes of learning and teaching, strengthening learner support, and improving learning outcomes. STEAM education – covering science, technology, engineering, arts, and mathematics – will also feature prominently at the conference, including keynotes and best practice presentations from scholars and practitioners to share their insights and experiences, as well as discuss the latest updates and research developments in the field.

Ever since the ICOIE was first held seven years ago, the conference has been proud to welcome academics, researchers, and stakeholders in the field of open and innovative education to participate in sharing research and best practices, as well as support cross-institutional collaboration both regionally and internationally. Thanks to the inspiring efforts of everyone involved, the conference continues to receive glowing feedback year-on-year. It is this positive reaction that has been a major driving force in establishing the ICOIE as a signature event of the OUHK.

I would like to extend my gratitude to the Wu Jieh Yee Charitable Foundation for its generous support of the speakers of the keynote sessions, workshops, and panel discussions. I would also like to once again thank the ICOIE Organizing Committee for their unwavering support and commitment to make the event a huge success. Finally, thank you to everyone for attending. I am certain that our sharing and exchange will contribute to advancing education and making it more flexible and innovative for the benefit of all. I wish you a productive and rewarding time at the conference.

Message from the President, The Open University of China



Dr Degang Jing
Secretary of the Party Committee
and President
The Open University of China

The Open University of China (OUC) and the Open University of Hong Kong (OUHK) are proud to be jointly hosting this year's International Conference on Open and Innovative Education. However, in light of the COVID-19 pandemic, we have moved the conference online. Firstly, on behalf of the OUC, I would like to extend a warm welcome to everyone in attendance and express my heartfelt thanks to the OUHK for their hard work on the conference. Over the past three years, the OUC and the OUHK have successfully held three symposiums on open and innovative education. This year, we are again working together on this international event to provide a platform for knowledge exchange and collaboration. I hope everyone here will make full use of this opportunity to share your experiences and achievements with your peers from across the globe.

The world is undergoing unprecedented changes, with waves of reforms and innovations rolling ever onward. As Chinese President Xi Jinping indicated at the opening ceremony of the Boao Forum for Asia, "Reform and innovations are the fundamental driving force of human progress. Those who reject them will be left behind and fade into history". For 40 years, the OUC has remained open-minded and committed to reform and innovation. We continue to adhere to the principle of "advanced communications technology plus well-designed courses by professional expertise" and the mission of "respecting learning, making learning universally beneficial, and providing education for all people with no differentiation". We firmly believe that we can successfully run an open university in the new era only by remaining true to our original aspiration and keeping our mission firmly in mind. To that end, we will keep reforming and innovating, and remain a driving force for the transformation and development of open universities everywhere.

Strengthening practical exchange and collaboration with open universities and international academic organisations around the world, as well as constantly improving the level of exchange and broadening the fields of cooperation, are important ways to promote educational innovations and speed up the process of internationalisation for the OUC. Not only do we actively participate in international open and distance education, but we also make sure to listen to the valuable insights of our global peers and use what we have learned to contribute meaningfully on the world stage.

As always, the conference will cover a wide range of exciting research topics, including learning analytics, artificial intelligence in education, engaging students and learning design, the impact of the pandemic on online learning, curriculum development and innovation, innovation in educational technology, mobile and ubiquitous learning, open education, open educational resources and massive open online courses, pedagogical innovations, social media and technology-mediated learning communities, STEAM education, technology-enabled student advising, and the application of virtual reality/augmented reality in education. I hope that the research results from these fields will both inspire and promote innovation.

Finally, I would like to thank the ICOIE 2020 Organizing Committee for its unrelenting efforts in putting together the conference. To our esteemed guests, thank you for taking part. I hope that you find the event productive and enjoyable. We invite you to visit the OUC to hold discussions and exchanges so that, together, we can create a better future for open education.

Message from the Chair, Conference Organizing Committee



Dr K C Li
Chair
Conference Organizing Committee

Openness and innovation are two major components of contemporary education, which have been increasingly emphasised among many educational institutions throughout the world. Within this context, the 2020 International Conference on Open and Innovative Education (ICOIE) continues to bring together researchers and educators to exchange the latest educational developments in relation to openness and innovation and their potential to enhance educational quality and academic achievements. This year, we are very glad that the Open University of China (OUC) joins us as a co-organizer.

In response to the global pandemic, ICOIE 2020 has taken on a virtual format. Despite this, we have received a comparable number of submissions as previous years, and nearly 80 papers submitted by authors from more than 20 countries or regions have been accepted for presentation after rigorous review. Their topics cover various areas ranging from emerging educational technologies such as learning analytics and artificial intelligence to educational innovations in learning design, curriculum development, and many others. To recognise the notable contributions of these authors, in addition to the Best and Excellent Paper Awards from previous years, there is also the new Student Paper Awards this year for the outstanding papers of postgraduate students.

This year's conference features a number of keynotes and a workshop covering the vast potential of online learning and teaching, the roles of artificial intelligence and big data, as well as the growing opportunities of STEAM education. We are honoured to have distinguished scholars to deliver them, including Professor Shunping Wei from the OUC, Professor Pedro Isaias from the University of New South Wales, Professor James Basham from the University of Kansas, Professor Jun Xiao from the Shanghai Open University, Professor Ken Kam Weng Tam from the University of Macau, and Professor Manolis Mavrikis from the University College London. I am sure we will learn a lot from their inspiring thoughts and insights.

In particular, the impacts of the global pandemic on learning and teaching is a focus of this year's conference. There will be a panel discussion forum with international experts – including Professor Dragan Gašević from the Monash University in Australia, Professor Kandarpa Das from the Krishna Kanta Handiqui State Open University in India, Professor Manolis Mavrikis, one of the conference's keynote speakers, and Dr Eva Tsang from the OUHK – to take part and address the relevant challenges and opportunities for educational providers.

Finally, I would like to give sincere thanks to the President and Provost of the OUHK for their support and encouragement. Their leadership has been a great asset for the success of the conference. Together with the untiring efforts of the Organizing Committee, Programme Committee, and colleagues in the Research Office and Educational Technology and Development Unit, this annual conference continues to be an excellent platform for promoting academic exchange and future research, both locally and internationally.

Committees

Organizing Committee

Chair:	K C LI	The Open University of Hong Kong
Vice-chairs:	Zhanrong LIU	The Open University of China
	Eva Y M TSANG	The Open University of Hong Kong
	Philips F L WANG	The Open University of Hong Kong
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	Simon K S CHEUNG	The Open University of Hong Kong
	Samuel P M CHOI	The Open University of Hong Kong
	Franklin S S LAM	The Open University of Hong Kong
	Patrick C W LEE	The Open University of Hong Kong
	Andrew K F LUI	The Open University of Hong Kong
	Ben NIU	The Open University of China
	Yunzhi SHI	The Open University of China
	C W TAM	The Open University of Hong Kong
	William K W TANG	The Open University of Hong Kong
	Ying WANG	The Open University of China
	Moon Y Y WONG	The Open University of Hong Kong

Programme Committee

Chair:	K C LI	The Open University of Hong Kong, China
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	Philips F L WANG	The Open University of Hong Kong, China
Members:	Ishan Sudeera ABEYWARDENA	University of Waterloo, Canada
	Mohamed ALLY	Athabasca University, Canada
	Melinda BANDALARIA	University of the Philippines Open University, Philippines
	Phalachandra BHANDIGADI	Wawasan Open University, Malaysia
	Alan BRUCE	Universal Learning Systems, Ireland
	Venus W M CHAN	The Open University of Hong Kong, China
	Simon K S CHEUNG	The Open University of Hong Kong, China
	Samuel P M CHOI	The Open University of Hong Kong, China
	Shane DAWSON	University of South Australia, Australia
	Vanessa DENNEN	Florida State University, USA
	Giuliana DETTORI	Istituto di Tecnologie Didattiche del CNR, Italy
	Bob FOX	The University of New South Wales, Australia
	Dragan GAŠEVIĆ	Monash University, Australia
	Juvy Lizette GERVACIO	University of the Philippines Open University, Philippines
	Kuo-chen HUANG	Beijing Normal University, China
	Pedro ISAIAS	The University of Queensland, Australia
	Siu Cheung KONG	The Education University of Hong Kong, China
	Franklin S S LAM	The Open University of Hong Kong, China
	Nancy LAW	The University of Hong Kong, China
	Patrick C W LEE	The Open University of Hong Kong, China
	Mei Kuen LI	The Open University of Hong Kong, China
	Andrew K F LUI	The Open University of Hong Kong, China
	Rory MCGREAL	Athabasca University, Canada
	Yosuke MORIMOTO	The Open University of Japan, Japan
	Kiyoshi NAKABAYASHI	Chiba Institute of Technology, Japan
	Matthew PISTILLI	Iowa State University, USA
	Rizwan SALEEM	Virtual University of Pakistan, Pakistan
	Jean SALUDADEZ	University of the Philippines Open University, Philippines
	Demetrios SAMPSON	University of Piraeus, Greece
	S Manzoor Hussain SHAH	Allama Iqbal Open University, Pakistan
	Tai Kwan WOO	Open University of Malaysia, Malaysia
	C W TAM	The Open University of Hong Kong, China
	William K W TANG	The Open University of Hong Kong, China
	Anuchai THEERAROUNGCHAISRI	Chulalongkorn University, Thailand
	Norman VAUGHAN	Mount Royal University, Canada
	Moon Y Y WONG	The Open University of Hong Kong, China
	Tsuneo YAMADA	The Open University of Japan, Japan
	Muhammad ZAHEER	Virtual University of Pakistan, Pakistan

About the Conference

The Open University of Hong Kong (OUHK) has been actively organizing and co-organizing international events to promote and facilitate academic sharing in open and innovative education for two decades. This conference series started in 2014 – was originally called International Conference on Open and Flexible Education (ICOFE) and renamed International Conference on Open and Innovative Education (ICOIE) in 2017.

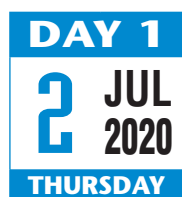
Openness and innovation are major trends in contemporary education, influencing the whole spectrum of education institutions across the globe. Technological advancement and breakthroughs are bringing about a paradigm shift in contemporary education. Modes of learning and teaching are becoming more open and innovative in terms of time, space, curriculum contents, organization, pedagogical methods, infrastructure and requirements. This change does not only happen in open universities (as well as open courses such as MOOCs of conventional institutions), but also regular courses of conventional tertiary institutions and schools. With this background, the OUHK has organized the annual conferences on open and innovative education with the following aims:

- provide a platform for sharing research, practices and views relevant to open and innovative education;
- facilitate networking and cross-institutional collaboration among researchers and educators in fields of educational innovation and/or openness; and
- promote open and innovative education research to enhance educational quality and achievements.

Topics of conference papers include the following:

- 1 Academic/learning analytics;
- 2 Artificial intelligence in education;
- 3 Engaging students and learning design;
- 4 Impacts of pandemic on online learning;
- 5 Innovations in curriculum development;
- 6 Innovations in educational technology;
- 7 Mobile and ubiquitous learning;
- 8 Open education;
- 9 Open educational resources and MOOCs;
- 10 Pedagogical innovations;
- 11 Social media and technology-mediated learning communities;
- 12 STEAM education;
- 13 Technology-enabled student advising;
- 14 Virtual reality/augmented reality in education; and
- 15 Other topics relevant to the conference.

Programme



13:30–13:45 Opening Ceremony
Welcoming Remarks
Prof. Yuk-Shan Wong
President
The Open University of Hong Kong

Welcoming Remarks
Dr Degang Jing
Secretary of the Party Committee and President
The Open University of China

Opening Address
Dr Kam Cheong Li
Chair, Organizing Committee

13:45–14:45 Keynote Session I

Intelligent Systems meet Humans-in-the-Loop: The Case of Blended Learning

Speaker
Prof. Manolis Mavrikis
Reader in Learning Technologies
University College London Knowledge Lab
University College London
Please refer to p.16 for details.

14:45–14:55 Break

14:55–15:55 Forum

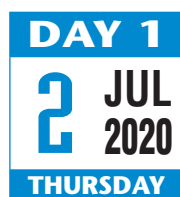
The Impact of Covid-19 on the Future of Online Learning

Forum Facilitator
Prof. Reggie Kwan
Provost
The Open University of Hong Kong

Speakers
Prof. Kandarpa Das
Vice Chancellor, Krishna Kanta Handiqui State Open University
Prof. Dragan Gasevic
Distinguished Professor of Learning Analytics, Faculty of Information Technology;
Director and Founder, Centre for Learning Analytics, Monash University
Prof. Manolis Mavrikis
Reader in Learning Technologies, University College London Knowledge Lab, University
College London
Dr Eva Tsang
Director of Educational Technology and Development, The Open University of Hong Kong

15:55–16:05 Break

Programme



16:05–17:05 Keynote Session II

Artificial Intelligence in Online Higher Education — Practice and Experience of Mainland China

Speaker

Prof. Shunping Wei

Professor and Deputy Director of IT Department

The Open University of China;

Deputy Director of Engineering Research Center for Integration and Application of E-Learning Technologies

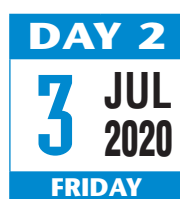
Ministry of Education, China

Please refer to p.17 for details.

17:05–17:15 Break

17:15–18:00 Parallel Paper Presentation Session I

Please refer to p.10 for details.



09:30–10:30 Keynote Session III

How will it Blend? Key Aspects of Blended Learning in Higher Education

Speaker

Prof. Pedro Isaías

Information Systems & Technology Management School

The University of New South Wales

Please refer to p.18 for details.

10:30–10:40 Break

10:40–11:40 Parallel Paper Presentation Session II

Please refer to p.11 for details.

11:40–11:50 Break

11:50–12:50 Parallel Paper Presentation Session III

Please refer to p.12 for details.

12:50–13:30 Break

13:30–14:00 Briefing on STEAM Education

14:00–15:00 Parallel Paper Presentation Session IV

Please refer to p.13 for details.

Workshop

Online Learner Personas in a Big Data Environment

Speaker

Prof. Jun Xiao

Professor, Shanghai Engineering Research Center for Open Distance Education

Shanghai Open University

Please refer to p.32 for details.

Presentations of Best Practices[#]

Vendor Exhibition

Programme

DAY 2
3 JUL
2020
FRIDAY

15:00-15:10 Break

15:10-16:10 Parallel Paper Presentation Session V
Please refer to p.14 for details.

Presentations of Best Practices[#]

Vendor Exhibition

16:10-16:20 Break

16:20-17:20 Keynote Session IV

STEM Diversity in 21st Century and a Case Study of Home-Based STEM Platform Using Portable Learning Technologies in Macao

Speaker

Prof. Ken Kam-Weng Tam

Associate Dean (Research and Graduate Studies), Faculty of Science and Technology;
Director, Centre for Science and Engineering Promotion

University of Macau

Please refer to p.19 for details.

DAY 3
4 JUL
2020
SATURDAY

09:30-11:00 Presentations of Best Practices[#]

Vendor Exhibition

09:30-10:50 Parallel Paper Presentation Session VI
Please refer to p.15 for details.

10:50-11:00 Break

11:00-12:00 Keynote Session V

Universal Design for Learning and the Modern Age of STEAM Education

Speaker

Prof. James Basham

Professor, Department of Special Education
University of Kansas

Please refer to p.20 for details.

12:00-12:15 Closing Ceremony with Award Presentation

Dr Kam Cheong Li

Chair, Organizing Committee

Closing Address

Dr Eva Tsang

Vice-chair, Organizing Committee

■ Highlighted sessions are events of STEAM Symposium taking place in parallel.

[#] Presentations should normally be delivered in English but may also be given in Cantonese (the local dialect).

Parallel Paper Presentation Session I

Room 1	Room 2	Room 3 (Student Presentation Session)
Pedagogical innovations	Engaging students and learning design	Pedagogical innovations
<p>Japanese University Students' E-Readiness: A Preliminary Study Yoko Hirata and Yoshihiro Hirata Hokkai-Gakuen University</p> <p style="text-align: right;">51</p>	<p>University Students' Perceptions of Technology Integration and the Relationships with Motivation, Time Spent and Learning Achievements in a General Elective Course Edith M. Y. Yan Beijing Normal University - Hong Kong Baptist University United International College</p> <p style="text-align: right;">26</p>	<p>Forming Digital Shepherds: Evaluating Participation in and Satisfaction with a Blended Learning Course on Communication Theology Irudayaselvam Stanislaus University of the Philippines Los Baños</p> <p style="text-align: right;">49</p>
<p>The Application and Effect of Smartphones and an Online Tutoring System for Vocabulary Drilling through Nine Semesters Jiyou Jia Peking University Zhenzhen Chen Beijing University of Posts and Telecommunications</p> <p style="text-align: right;">50</p>	<p>English Writing through Drama with Process-writing and Collaborative Approaches: A Case Study in Hong Kong Tung Hiu Hon The Open University of Hong Kong</p> <p style="text-align: right;">29</p>	<p>Engaging students and learning design</p> <p>A Study on the Factors That Contribute to the Growth of Idea Generation Ability in Design Education Oustamanolakis Mike Hong Kong Polytechnic University</p> <p style="text-align: right;">27</p>
<p>Research and Practice of College Teaching of English Listening from the Perspective of Multi-modal Discourse Xueyu Sun Jiangsu Open University Shaohua Wang Nanjing Normal University</p> <p style="text-align: right;">49</p>	<p>Teaching Soft Skills at University: A Dichotomous Thinking Approach Peter Carter, Etsuko Kakimoto and Kaori Miura Kyushu Sangyo University Mat Asser Seinan Gakuin University</p> <p style="text-align: right;">28</p>	<p>Virtual reality/ augmented reality in education</p> <p>Effects of the Interaction Degree of Environment Based on Virtual Reality on Oral English Learners' Cognitive Load and Learning Achievement Caifeng Sun, Ruofan Wang and Xindong Ye Wenzhou University</p> <p style="text-align: right;">56</p>

Parallel Paper Presentation Session II

Room 1	Room 2	Room 3
Innovations in educational technology	Pedagogical innovations	Impacts of pandemic on online learning
<p>The Effectiveness of Team-Based Learning for Third-year Diploma in Nursing Students Sivaneswary Palanibilo, Beatrice Nayagam, Nasirudeen Ama and Preetam Rai Ngee Ann Polytechnic</p> <p>39</p>	<p>A Framework of Smart Pedagogy Based on the Facilitating of High-order Thinking Skills Qingquan Meng and Jiyou Jia Peking University Zhiyong Zhang Huangdu Middle School</p> <p>51</p>	<p>Reacting to the Coronavirus: A Case Study of Science and Engineering Education Switching to Online Learning in a Sino-foreign Higher Education Institution Amarpreet Gill, Derek Irwin, Dave Towey, James Walker and Yanhui Zhang University of Nottingham Ningbo China</p> <p>32</p>
<p>A Mobile App for Learning Java through Games Wan Yu Terri Wong, Ka Wing Tse, Tsz-Hin Kwan, Ho-Hin Pun and Lok Luk-Man The Open University of Hong Kong</p> <p>40</p>	<p>The Flipped Classroom Complements Peer Instruction: Better Student Perception and Higher Chemistry Achievement Aphrodite M. Macale, Marivic S. Lacsamana, Maria Ana T. Quimbo and Edmund G. Centeno University of the Philippines Los Baños</p> <p>53</p>	Innovations in educational technology
		<p>Enhancing Special Educators through an Information and Communication Technology Learning Design Paradigm: A South-Indian Perspective Amali Arockia Selvi Manonmaniam Sundaranar University</p> <p>41</p>
		Artificial intelligence in education
		<p>Effective Use of a Small Amount of Graded Answers for Automated Grading of Short Answers Andrew Kwok Fai Lui, Sin Chun Ng and Stella Wing Nga Cheung The Open University of Hong Kong</p> <p>25</p>
		Pedagogical innovations
		<p>Use of Free and Open Source Software (FOSS): International Development and its Implications for Higher Education in Hong Kong Chenggui Duan and Tracy K. Lee Chu Hai College of Higher Education</p> <p>53</p>

Parallel Paper Presentation Session III

Room 1	Room 2 (Student Presentation Session)	Room 3
Innovations in curriculum development	Innovations in curriculum development	Impacts of pandemic on online learning
<p>Employing a Technologically-assisted Teaching and Learning Strategy in the English as a Foreign Language Classroom: The Application of the Visual-only Video Teaching Strategy</p> <p>Luis Miguel Dos Santos Woosong University</p> <p style="text-align: right;">36</p>	<p>The Relationship among Different Types of Students' ICT Use, Their Academic Achievement, and the Country-level Economy Index: A Multilevel Analysis</p> <p>Seoyeon Park and Wenting Weng Texas A&M University</p> <p style="text-align: right;">35</p>	<p>To Pass or Not to Pass? How Are Open Universities and Students Coping with the Covid-19 Pandemic?</p> <p>Consuelo Dl. Habito and Rhea Ariele R. Pascua University of the Philippines Open University</p> <p style="text-align: right;">33</p>
Open education	Academic/Learning analytics	Suspending classes without stopping learning: How emerging educational technologies facilitate online learning for OUHK teachers and students during the social unrest and COVID-19 pandemic
<p>Comparison of the Socio-economic Status of Undergraduates in Conventional and ODL Universities</p> <p>K.A.J.M. Kuruppuarachchi and V Sayakkarage The Open University of Sri Lanka</p> <p style="text-align: right;">43</p>	<p>Teaching Focus Identification in Junior High School Mathematics</p> <p>Huixiao Le and Jiyou Jia Peking University</p> <p style="text-align: right;">23</p>	<p>Eva Y.M. Tsang and Dominic C.W. Pang The Open University of Hong Kong</p> <p style="text-align: right;">33</p>
Open educational resources and MOOCs	Open education	Academic/Learning analytics
<p>Fundamentals of Adjusting MOOCs in Acquiring Innovation Competencies</p> <p>Maximus Gorky Sembiring Universitas Terbuka Indonesia Gayuh Rahayu IPB University</p> <p style="text-align: right;">46</p>	<p>Accessing E-Resources in Local Languages for Lifelong Learning: A Study of Open Universities in India</p> <p>Farah Diba and Anita Priyadarshini Indira Gandhi National Open University</p> <p style="text-align: right;">44</p>	<p>Perception of Online/Blended Learning at the Time of the Pandemic: An Academic Analytics in the Indian Context</p> <p>Ritimoni Bordoloi, Prasenjit Das and Kandrappa Das Krishna Kanta Handiqui State Open University</p> <p style="text-align: right;">23</p>

Parallel Paper Presentation Session IV

Room 1	Room 2 (Student Presentation Session)
Innovations in educational technology	Pedagogical innovations
<p>Enhancing the Knowledge of Chinese Orthography in Junior Education Ka Wing Tse, Wan Yu Terri Wong, Shing-Tung Cheng, Ka-Ki Chau and Chi-Chung Tam The Open University of Hong Kong</p> <p style="text-align: right;">39</p>	<p>How Teachers' Engagement Affects Intelligent Tutoring Systems Integration Seoyeon Park and Wenting Weng Texas A&M University</p> <p style="text-align: right;">50</p>
<p>Factors Affecting the Use of an Online Learning System Tai Ming Wut and Helen Wong College of Professional and Continuing Education, The Hong Kong Polytechnic University</p> <p style="text-align: right;">40</p>	<p>English Pop Songs Facilitate Informal Language Learning with Learner Autonomy Siqi Wu Beijing Normal University - Hong Kong Baptist University United International College</p> <p style="text-align: right;">48</p>
<p>A Blockchain Framework for Managing Students' Community Engagement June Tay and Ivy Chia Singapore University of Social Sciences</p> <p style="text-align: right;">41</p>	<p>Open and Distance Education: Media Pedagogy, Open Educational Resources and Universal Design for Learning Satyendra Kumar Indira Gandhi National Open University</p> <p style="text-align: right;">52</p>
Impacts of pandemic on online learning	
<p>Educational Responses of Anadolu University Open Education System during the Covid-19 Pandemic Selim Başar, Sinan Aydin, Lili Feng and Hasan Ucar Anadolu University</p> <p style="text-align: right;">34</p>	

Parallel Paper Presentation Session V

Room 1	Room 2 (Student Presentation Session)	Room 3 (Putonghua Session)
Open educational resources and MOOCs	Engaging students and learning design	Open education
<p>Prospects for Agricultural MOOCs in an ODL System: YCMOU's Experience Madhuri Shrikant Sonawane Yashwantrao Chavan Maharashtra Open University 45</p>	<p>Perceptions of Students and Teacher towards the Effects of Within-class Ability Grouping: A Case Study Chenxi Wang Beijing Normal University - Hong Kong Baptist University United International College 27</p>	<p>A Study on the Characteristics of Bachelor's Degree Awardees of the Open University of China Li Sun The Open University of China 44</p>
<p>MOOCs of Inclusive Technology in Higher Education for Vocational and Professional Education and Training Benson Kin Ho Hung Vocational Training Council 47</p>	<p>The Influence of Different Collaborative Peer Assessment Strategies on Learning Achievement and Higher-order Thinking Tendency Jian-Wen Fang Taiwan University of Science and Technology 28</p>	
STEAM education	Artificial intelligence in education	Mobile and ubiquitous learning
<p>A Case Study on Using Technology-assisted Active Learning Components for Science Foundation Subjects Po Yee Chung, Alex Wong, Chi Wah Leung, Chee Leung Mak, Kai Pan Mark, Chun Seng Chan, Laura Zhou, Jenny Lam, AF Gui Dean, Fridolin Ting, Chunghin Chui and Kim Hung Lam Hong Kong Polytechnic University 55</p>	<p>The Design and Development of an Intelligent Online Proctoring System for Online Exams Yunfan He and Jiyou Jia Peking University 25</p>	<p>Usability Assessment of a Library-associated Mobile Learning App for the Visually Impaired Yun Fang Tu and Gwo Jen Hwang Taiwan University of Science and Technology 42</p>
		<p>Development of STEAM Robotic Courses to Enhance Students' Tendency to Develop 21st Century Skills Yen-Han Chen and Chiu-Lin Lai Taipei University of Education 55</p>

Parallel Paper Presentation Session VI

Room 1	Room 2 (Student Presentation Session)	Room 3
Social media and technology-mediated learning communities	Open educational resources and MOOCs	Engaging students and learning design
<p>Social Media — a Supplement and Complement to Learning Management Systems in Online Distance Learning Yujen Ho Open University of Kaohsiung</p> <p style="text-align: right;">54</p>	<p>MOOCs as an Effective Pedagogy for the Least Developed and Resource Constrained Countries: Experiences from Nepal Parbat Dhungana Kathmandu University Prakash Dhimi Creative Academy</p> <p style="text-align: right;">45</p>	<p>Navigating Student Expectations in Online Design Knowledge-building Kutay Guler Kansas State University</p> <p style="text-align: right;">30</p>
Impacts of pandemic on online learning	Innovations in educational technology	The Moderating Role of Organizational Performance Linking Human Resource Management and Outstanding Outcomes in an ODL Context
<p>Addressing the Challenges of Online Teaching at the Time of the Covid-19 Pandemic: A Case Study of the OUHK Business School Samuel P.M. Choi, S.S. Lam, Eddie C.Y. Ng, Jacky P.Y. Cheung and Susanna Y.N. Wong The Open University of Hong Kong</p> <p style="text-align: right;">34</p>	<p>Quizlet: The Effect of Mobile Applications on L2 Vocabulary Learning Xiaoyu Ren Beijing Normal University - Hong Kong Baptist University United International College</p> <p style="text-align: right;">37</p>	<p>Maximus Gorky Sembiring and Rizki Hersada Sembiring Universitas Terbuka Indonesia Gayuh Rahayu IPB University</p> <p style="text-align: right;">26</p>
Innovations in educational technology	Mobile and ubiquitous learning	The Design of Open Education Resources for Engineering Students Based on the Working Process
<p>E-Exams: Assessing the Next Generation Jessie Tan, Paul Ng, Chiew Hun Phang, Jennifer Bao and Martin Kwan Ngee Ann Polytechnic</p> <p style="text-align: right;">38</p>	<p>Survey and Analysis of the Online Learning on a Physics Experiment Course Jiyu Cai, Kai Fang and Chen Ni Tongji University</p> <p style="text-align: right;">42</p>	<p>Sun Zhijuan The Open University of China</p> <p style="text-align: right;">31</p>
Innovations in curriculum development		Impact of Teacher Presence on University Student Motivation
<p>Microlearning in Technical and Vocational Education and Training (TVET): A Case Study during the COVID-19 Outbreak in Hong Kong Tianchong Wang The Chinese University of Hong Kong Dave Towey University of Nottingham Ningbo China Ricky Yuk-kwan Ng Vocational Training Council</p> <p style="text-align: right;">35</p>		<p>Holly Chung The Hang Seng University of Hong Kong</p> <p style="text-align: right;">29</p>

Keynote Session I



Prof. Manolis Mavrikis
Reader in Learning Technologies
University College London Knowledge Lab
University College London

Prof. Manolis Mavrikis is a Reader in Learning Technologies at University College London (UCL) Knowledge Lab, a research centre at the UCL Institute of Education faculty. Prof. Manolis Mavrikis conducts research to understand the process of development of digital technologies and to support and transform education. In particular, his interests and experience lie at the intersection of artificial intelligence (AI), human-computer interaction (HCI), and educational technology (EdTech). His research agenda revolves around the design, development and thorough evaluation of supportive technologies for learning, teaching, and research. Prof. Manolis Mavrikis is currently editor of BERA's British Journal of Educational Technology and Programme Lead for the Master's in Education and Technology at UCL.

Keynote address

Intelligent Systems meet Humans-in-the-Loop: The Case of Blended Learning

Drawing on examples from academic research in the fields of artificial intelligence in education (AIED) and learning analytics (LA), and amidst growing interest in educational technology, this talk will cut through the current hype and make a case for carefully designed systems that take into account the role of teachers, students and parents in education. Building on growing concerns about the role of AI in society, and big data and big companies entering education, I will offer possible responses challenging us all, as designers, developers and educators, to seize the opportunities afforded by the emerging technological context to carefully consider our design choices, bring humans-in-the-loop and orchestrate blended learning.

Keynote Session II



Prof. Shunping Wei

Professor and Deputy Director of
IT Department
The Open University of China

Deputy Director of Engineering
Research Center for
Integration and Application of
E-Learning Technologies
Ministry of Education, China

Prof. Shunping Wei is a Professor at the Open University of China (OUC), Deputy Director of the IT Department of OUC, as well as Deputy Director of Engineering Research Center for Integration and Application of E-Learning Technologies, Ministry of Education. Prof. Shunping Wei is a leading researcher in education big data and learning analytics. He has authored over 100 research papers in the areas of educational data mining, learning analytics, knowledge engineering and Chinese corpus, and has published five monographs including *Educational Data Mining*, *Online Learning Analytics*, *Instructional Design Expert System*.

Keynote address

Artificial Intelligence in Online Higher Education — Practice and Experience of Mainland China

Artificial intelligence (AI) is an important driving force to lead a new round of scientific and technological revolution and industrial transformation. It is profoundly changing people's way of work, life and learning. In China, people from the Government, schools, enterprises and research institutions are committed to maximizing the advantages of online education and artificial intelligence, innovating education and learning methods, and accelerating the development of a more open and flexible education system suitable for everyone. Based on China's policy in the past five years, research papers, news and other data, this talk will summarize the main forms of AI applications in higher education, including learning about AI, learning by AI, learning with AI and learning from AI, and analyze the key factors influencing AI applications in higher education, including massive and high-quality educational data, fast and efficient cloud computing infrastructure, rich and effective deep learning algorithm and traditional machine learning algorithm. In future, China's education sector will pay more attention to the accumulation and cleaning of education big data, deployment of a public service platform of educational AI based on cloud computing services, AI literacy training for teachers and students, and the ethical issues caused by replacing teachers with AI. The sector will work together to realize the human education ideal of "teaching without discrimination and teaching according to aptitude".

Keynote Session III



Prof. Pedro Isaias
Information Systems &
Technology Management School
The University of New South Wales

Prof. Pedro Isaias is affiliated with the Information Systems & Technology Management School of The University of New South Wales (UNSW – Sydney), Australia. Previously he taught at The University of Queensland, Brisbane, Australia. Before moving to Australia, he served at the Universidade Aberta (Portuguese Open University) in Lisbon, Portugal, where he was responsible for several courses and director of the master degree program in Management / MBA. Pedro was director of the master degree program in Electronic Commerce and Internet for 10 years.

Prof. Pedro Isaias holds a PhD in Information Management (in the specialty of information and decision systems) from the New University of Lisbon. Author of several books, book chapters, papers and research reports, all in the information systems area, he has headed several conferences and workshops within the mentioned area. He has also been responsible for the scientific coordination of several EU funded research projects. He is also member of the editorial board of several journals and program committee member of several conferences and workshops. Currently he conducts research activity related to MIS in general, and more specifically Learning Technologies, Data Analytics, Business Intelligence, Digital Transformation, e-Business and WWW related areas.

Keynote address

How will it Blend? Key Aspects of Blended Learning in Higher Education

Within the Higher Education sector, blended learning strategies succeed largely because of their promise to deliver the best of both worlds to students: face-to-face education and online learning. The implementation of blended learning in courses and programmes is commonly associated with an enhanced student experience resulting from broader access to learning resources, improved interactivity and cooperation, increased participation and motivation, and increased control of students' own learning. As an increasing number of higher education institutions are revising their courses to provide blended learning opportunities for their students, it is important to explore how and to what extent such opportunities can be achieved. This keynote presentation addresses the benefits and challenges of blending a course, alternative platforms and technologies that can be used. Based on the experience in developing and evaluating various courses, the author will also be covering key findings regarding different blending initiatives and how to evaluate the whole process.

Keynote Session IV



Prof. Ken Kam Weng Tam
Associate Dean (Research and Graduate Studies), Faculty of Science and Technology;
Director, Centre for Science and Engineering Promotion,
University of Macau

Prof. Ken Kam-Weng Tam is a Professor and the Associate Dean (Research and Graduate Studies) of the Faculty of Science and Technology of the University of Macau. Since 2018, he is founding Director and Director of Centre for Science and Engineering Promotion of University of Macau providing the unique platform for K12 and university students STEM education in Macao. From 2000 to 2001, he was the Director of the INESC, Macau, developing different informatics system including smart postal box for Macau Post. In 2001, he co-founded the microelectronic design house in Macao, where he was the General Manager until 2003. His current research interests include multifunctional microwave circuits and sensors, radiofrequency identification (RFID), and ultra-wideband for material analysis. Prof. Tam was a member of the Organizing Committees of 21 international and local conferences as Chairs and Co-Chairs. He supervised two IEEE Microwave Theory and Techniques Society Undergraduate Scholarship recipients in 2002 and 2003. Prof. Tam is also vice-president (conference) of IEEE Council on RFID, Associate Editor of IEEE Journal of Radio Frequency Identification, Chartered Engineer (CEng) and Fellow of IET. In addition, he was the recipient of Young Scholar Award of the University of Macau in 2001 and third class prize of Technological Invention Award of Macao Science and Technology Awards in 2012. Recently, he also was the recipient of Champion of “IEEE Mega-challenge 2017: Smart Cities” competition.

Keynote address

STEM Diversity in 21st Century and a Case Study of Home-Based STEM Platform Using Portable Learning Technologies in Macao

In this talk, the diversity and development of STEM education in 21st century are reviewed including Macao’s experience like the University of Macau’s research-oriented STEM platform together with some successful stories of high schools’ STEM achievements in collaboration. One of STEM education diversities is about the emerging portable learning technology. This enabling technology including computer-based instrumentation and measurement has gradually become common in classrooms and laboratories, but few trials have been made to apply them for STEM (Science, Technology, Engineering and Mathematics) learning at home in order to improve students’ STEM engagement, exploration and practice. As a case study of STEM diversity, a home-based STEM platform for fractional order impedance characterization of some botanical materials like potatoes is presented. This platform was tested by the students in Macao during the epidemic period from late January to early May 2020. Due to the unexpected worldwide coronavirus impact, all regular classes were suspended and only online teaching was available. It was found that this platform provides an effective and attractive learning approach at home. This home-based STEM platform is also a welcoming tool for emerging smart learning applications.

Keynote Session V



Prof. James Basham

Professor, Department of Special Education
University of Kansas

Prof. James Basham is a Professor in the top-ranked Department of Special Education at the University of Kansas. He is also the Senior Director for Learning & Innovation at CAST (<http://www.cast.org/>), a Boston-based research and development non-profit organizations and founder of the Universal Design for Learning (UDL) framework. Prof. Basham is also one of the cofounders of the UDL Implementation and Research Network (UDL-IRN), a global network of educators, education leaders, researchers, and industry leaders which focused on supporting the design of UDL based learning environments. His work is focused on developing future-ready learning environments that are equitable, beneficial, and meaningful for all learners. Prof. Basham has conducted research on UDL relative to its implementation and relationship with STEM/STEAM education, learner-centered design, innovation, online learning, technology, space-design, and human learning. He has served as a consultant for school districts, universities, regional and national education agencies, foundations, and corporate entities. He is well published, has given hundreds of talks, and serves on various national and international boards for journals, companies, and education organizations.

Keynote address

Universal Design for Learning and the Modern Age of STEAM Education

As we consider the emergence of the Fourth Industrial Revolution and issues of modernity, including the current pandemic, there is a need to redesign the traditional education system. The future of humanity requires a globally focused citizenry that supports dynamic interdisciplinary and systems level thinking, innovation, and creativity as a more rapidly evolving and pluralistic existence shapes the human experience. The future of learning relies on educators developing and adopting flexible crosscutting approaches designed for all learners. A critical consideration in this evolution is supporting education systems to move past the rigid structures associated with the siloed academic discipline and one-size-fits-all model of education to a dynamic system that is flexible and more personalized for all learners. To support this future, education systems must consider how to develop learning environments and experiences that interweave learning across science, technology, engineering, the arts, and mathematics (STEAM) based on the Universal Design for Learning (UDL) framework. This talk will highlight how UDL provides a strong foundational design framework for the future of education across STEAM learning experiences. Examples, research, and resources will be provided as educators, education leaders, and university academics consider the future of learning design.

Workshop Speaker



Prof. Jun Xiao

Professor, Shanghai Engineering Research
Center for Open Distance Education
Shanghai Open University

Prof. Jun Xiao oversees the operation of Shanghai Engineering Research Center of Open Distance Education, Shanghai Open University. His research interests lie in hybrid learning spaces, learning analytics, learner persona, augmented reality, artificial intelligence. He is a Member of China E-learning Technology Standardization Committee, and has undertaken and participated in a dozen of national and provincial level projects. Prof. Xiao has obtained awards for more than 10 scientific research works, and has published over 100 books, articles and reports in the areas of education technology, lifelong learning, and open distance education. He has made substantial contributions to the design of many online and smart learning environments in Shanghai, such as the Shanghai Learning Network, Shanghai Education Resource Center and Mobile MOOC for Teacher Professional Development, and his research findings have effectively informed the design of lifelong learning public service platform for Shanghai citizens. He is now responsible for the construction of the Smart Learning Center of Shanghai Open University, a project which provides an online-merge-online (OMO) smart learning environment for seamless learning.

Abstract

Online Learner Personas in a Big Data Environment

Learner persona is not only an application of user persona in the field of education, but also a new application of learning analytics. By collecting data about student learning in a big data environment, learners' characteristics are analyzed in multiple dimensions and presented in the form of labels to form learner personas, so as to provide accurate learning support services and improve learning experience. Using open learning analytics, a five stage system framework for an open learner persona is proposed: persona target, data collection, persona modeling, persona output, and persona application and evaluation. Some related application research cases are as follows: 1) providing information for making teaching decisions for online learners by constructing open learners' personas; 2) providing visual analytics of learners' personas for personalized learning early warning, personalized learning recommendations and other intelligent personalized learning services; 3) assessing students' learning effectiveness in their use of augmented reality courseware through the construction of personas in the AR environment; 4) providing full personas of online-merge-offline (OMO) smart classroom to promote smart teaching and learning; and 5) providing a monitoring tool for the AI ability of lifelong learners.

Abstracts of Papers

An effort has been made to classify the abstracts under the conference sub-themes to which they primarily relate, although in some cases they obviously span more than one sub-theme.

Teaching Focus Identification in Junior High School Mathematics

Huixiao Le and Jiyou Jia
Peking University



This research aims to identify the teaching focus in junior high school mathematics from a quantitative approach.

Firstly, this research conceptualizes the teaching focus based on a literature review. All the content in junior high school is seen as a network composed of several knowledge points. Such a network is operationalized into two graphs, namely the conceptual network and test information network, from the theoretical perspective of epistemology. In the conceptual network, the nodes represent knowledge points and the edges represent the conceptual connections between them. Natural language processing is applied to compute the semantic similarities between the related corpuses of these knowledge points, and the similarities are used to identify the edges in the conceptual network. In the test information network, the nodes represent knowledge points, while the edges represent the correlation of students' test performance between the related knowledge points. Social network analysis methods are applied to identify the key elements in the networks. In addition, a moderation analysis is done to investigate the influence of students' mastery level of each unit on their follow-up performance based on a dataset of more than 3 million items of students' test-log records and 870,119 items of test-questions. Such results give three quantifiable indicators. Finally, those indicators are integrated and visualized to get a comprehensive understanding of the relative importance of each unit.

This research obtained a set of indices that comprehensively described the relative importance of each unit in junior high school mathematics. Furthermore, this study had three findings: (1) the content in Grade 1 should be the teaching focus; (2) generally, algebra and geometry are two key parts; and (3) the knowledge related to the triangle is of great significance in the knowledge structure.

Understanding the teaching focus in junior high school mathematics is of great significance for teaching. Nevertheless, the identification of the teaching focus is problematic for both researchers and instructors. Current empirical studies, which usually use questionnaires and other qualitative methods to discuss the teaching focus in teachers' concepts, have produced rather limited conclusions. This research adopted a quantitative method based on large-scale online learning activity records and calculates the relative importance of each unit. In addition, it provides researchers with a compatible and general technical frame for identifying the teaching focus in online courses. Apart from providing a list that can offer teachers the relative importance of the units, another chief value of this study is that it provides researchers with a compatible method that can identify key contents in online courses based on students' log data.

Perception of Online/Blended Learning at the Time of the Pandemic: An Academic Analytics in the Indian Context

Ritimoni Bordoloi, Prasenjit Das and Kandarpa Das
Krishna Kanta Handiqui State Open University

During a crisis situation, such as a pandemic, war or a natural disaster, online and blended learning can meet the academic needs of the learners in a bigger way. The use of ICT-based technologies has significantly transformed the teaching pedagogy into a learner-centred one, following which it becomes necessary for both the teachers and learners to acquire the basic skills for using technology. It is therefore important to examine the perceptions of the teachers and learners on the use of online learning in their regular curriculum transactions, particularly during the current Covid-19 pandemic which has adversely affected millions of learners across the world. Thus, the objectives of this paper are to:

- find out, in general, the prospects and challenges of providing online/blended learning opportunities in a country like India;
- examine whether the use of techno-pedagogy enhances the idea of teaching and learning during the Covid-19 lockdown and the post-lockdown period; and
- look at the future prospects for delivering sustainable and quality learning opportunities to the learners across India through the online mode so that a suitable learning pedagogy can be adopted in the country.

The academic analytics approach was used for this study. A structured questionnaire was designed in a Google Form, covering the perceptions of the learners and teachers in different Indian universities and colleges regarding online and blended services; and an analysis was carried out using Google analytics. The data received were analysed by using simple statistics, such as percentages.

It was found that online and blended learning could be the solution for providing education in the context of 21st century India. Unlike in conventional education, open education has widened the scope of learning through the motto- "Bring your own device." The extensive use of OERs, MOOCs and social media has opened up the minds of knowledge-hungry people and has helped them to receive much-needed training and skills even during the current pandemic.

This study will help in preparing a roadmap, at the policy level, for the use of online and blended teaching/learning models which benefitted both the teachers and learners at the time of the pandemic and also in the post- lockdown period.

The Application Status and Demand for Artificial Intelligence Education – the Survey of Online Learners in Shanghai



Lamei Wang and Jun Xiao
Shanghai Open University

Artificial intelligence (AI) has become the core driving force in a new scientific and technological revolution, expanding and penetrating the field of education, enabling education, and promoting the development of intelligent education. This research mainly analyzes the current application status of AI in the field of online learning in Shanghai, and examines Shanghai online learners' need for, and attitudes to, AI education.

In this study, questionnaires were designed on four aspects of AI education: a cognitive survey, a demand survey, an application status survey, and an attitude survey. The survey on the cognitive level focused on learners' understanding of artificial intelligence, while that on the demand level focused on the learners' expectations about the future of artificial intelligence in education and teaching. The survey on the application status focused on the current system or service of education assisted by artificial intelligence used by the learners; and, finally, the survey on the attitude level focused on the understanding of learners' attitudes, values and concerns about the application of artificial intelligence in education and teaching. A total of 6,500 questionnaires were distributed to university students, community residents, and corporate white-collar workers in Shanghai. A total of 6,307 valid questionnaires were returned.

The research results showed that more than 90% of the 31 to 40 age group were willing to accept payment for artificial intelligence learning, and the 41 to 50 age group was the main group with high learning consumption. From the analysis of application experience and the demand situation, more than 80% of online learners in Shanghai did not yet have a high level of contact with, or a deep awareness of, artificial intelligence – most of them were focusing on lightweight intelligent education applications, and still waiting for heavyweight artificial intelligence products to appear. Based on the advantages of the applications of artificial intelligence and the analysis of the values of the application of auxiliary education, the intelligent teaching aids with convenience were favoured by more than 70%, and have expanded to areas such as education equity, intelligent management and decision-making, and emotional education. From the analysis of the future outlook, more than 60% of Shanghai learners had a more positive attitude towards the application of artificial intelligence in the field of education and teaching, but they were also increasingly aware of the need for the protection of personal information and the maintenance of human emotions.

Originality/value/implications – This research investigated the need for, and attitudes to, artificial intelligence education for online learners in Shanghai. It aimed to form an AI portrait of online learners in Shanghai and provide suggestions on how artificial intelligence can better promote the development of education.

The Design and Development of an Intelligent Online Proctoring System for Online Exams



Yunfan He and Jiyou Jia
Peking University

During the outbreak of the novel coronavirus epidemic, almost all educational institutions in the world used online learning as the best way to maintain the teaching and learning schedule for all students. However, current online instruction platforms lack the function to prevent the learners from cheating in online exams and guarantee fairness and equality for all examinees as in traditional classroom exams. Based on the advancement of artificial intelligence technology, we attempt to design, develop and test an intelligent online proctoring system (IOPS) to monitor the online examination, which is urgently needed in online learning settings worldwide.

The IOPS uses the B/S (Browser/Server) architecture. The server side is implemented with the programming languages JavaScript and Python, and stores the identification data of all examinees and their important behavioural changes, including facial expression, eye and mouth movement, and speech. The browser side collects and analyzes multimodal data of the examinee writing the online test locally, and transfers the examinee's most important behavioural changes to the server. Real-time face recognition will be executed based on some well-performed technology (dlib); and voice will be detected and transferred through Julius. The system also detects the process switch of the examinee's computer. For the examinee's multimodal signals, the system uses some machine learning techniques to judge whether he/she is cheating.

Hopefully, the system will be fully implemented by the time of the conference. Once it is completed and evaluated, the relevant evaluation will be reported, including the feedback time, precision and recall ratio.

Though synchronous video and audio capture technology can be used to record the face, body movement and speech of the examinee and his/her surroundings, the required network bandwidth and speed, and the laborious and instant one-to-one monitoring of the video and audio signal by the examiner makes such capture technology very expensive and unfeasible. The intelligent online proctoring system could be a stable and practical approach to meeting the needs of online examinations, and a valuable contribution to online and distance learning.

Effective Use of a Small Amount of Graded Answers for Automated Grading of Short Answers

Andrew Kwok-Fai Lui, Sin-Chun Ng and
Stella Wing-Nga Cheung
The Open University of Hong Kong

Automated grading uses a computer program to classify answers into correct, wrong and other discrete levels of correctness. Short answer questions offer unique teaching and learning benefits. There are two essential components of automated grading, namely a set of graded answers that provides references for the grade classification, and techniques to measure and differentiate answers. Automated grading plays an important role in improving the online learning experience and learning effectiveness. However, its actual deployment is both costly and time-constrained. Large and comprehensive graded answer sets, which are desirable for accurate classification, are rare.

The purpose of this research is to investigate more effective use of a small amount of graded answers for automated short answer grading. A sample of graded answers offers the semantics of correct and wrong answers. The unsupervised approach of automated grading first divides answers into clusters of similar semantics, and then assigns grades to the answers in a cluster with reference to the graded sample. This approach may create inconsistent clusters, which contain both correct and wrong graded answers. The relational information between answers in a graded sample can be used to validate clusters and improve the consistency.

A novel semi-supervised answer clustering method that utilizes a small sample of graded answers is proposed. Two differently graded answers can form a constraint for guiding the classification of answers. This novel method is a key stage in the computing process for short answer grading, the architecture of which is also proposed. The process consists mainly of four stages, which are the representation mapping stage, the refinement stage, the dividing stage, and the grading stage.

The proposed computing method for short answer grading was shown to be a feasible architecture through implementation of a prototype. A preliminary study was carried out to evaluate the performance of the proposed novel semi-supervised answer clustering method. A gold standard short answer grading dataset was used to provide test data for the experiments. It was found that the novel clustering method was better able to produce consistent answer clusters with a small graded sample. The study revealed important technical issues that should be the focus of further development of this method.

There are currently over a hundred million registered users in Massive Open Online Course (MOOC) platforms. A full range of assessment support that includes short answer questions is important for the perceived educational value of MOOCs. Effective automated grading methods will significantly enhance the online learning experience as well as the learning effectiveness.

University Students' Perceptions of Technology Integration and the Relationships with Motivation, Time Spent and Learning Achievements in a General Elective Course

Edith M. Y. Yan

Beijing Normal University - Hong Kong Baptist University United International College

Previous studies on technological pedagogical content knowledge (TPACK) in higher education settings have focused mainly on faculty TPACK development. Research on students' perceptions of faculty TPACK and technology integration in teaching has been scarce. Such student perceptions might have an impact on their learning outcomes. Therefore, the present study investigates the relationships between university students' perceptions of technology integration of a general elective (GE) course and their learning achievement (in terms of course total scores) and other related variables.

The participants were 74 undergraduate students from two sections of a GE course offered at an English-medium university in China during Semester 1 of 2019–2020. Data were collected from an in-class survey in Week 11 and grade reports at the end of the semester. The questionnaire included (1) a section on demographic information; (2) a 7-item scale measuring the respondents' own technology knowledge (sTK Scale); (3) a 9-item scale eliciting respondents' judgement of their teacher's TPACK (tTPACK Scale); and (4) a 13-item scale measuring their use of educational technology in the course (TU Scale). The sTK and tTPACK Scales were adapted from the TPACK survey instrument (Schmidt et al., 2009), and the TU Scale was modified from the self-reflected items for the T3 Framework (Magana, 2017). Pearson correlation coefficients were computed to determine the associations between the sTK Scale, tTPACK Scale, TU Scale, and other variables (self-reported cumulative GPA, motivation to study the course, self-perceived performance in class, self-reported average time spent per week on studying the course, and standard scores for course total scores).

The results showed that motivation was significantly and moderately correlated with the tTPACK Scale and TU Scale, and the average time spent on studying the course was significantly and weakly correlated with the sTK Scale, tTPACK Scale and TU Scale. The cumulative GPA, self-perceived performance and course total scores were not associated with the sTK Scale, tTPACK Scale or TU Scale. In other words, students who perceived that the instructor had better TPACK and the course went with greater educational technology use tended to be more motivated and spent more time in studying the course. Students who considered themselves to have better technological knowledge also tended to spend more time on studying the course.

Despite students' academic abilities and learning outcomes not being associated with their perceived faculty TPACK and technology use in class, this preliminary study provided clear evidence about the importance of technology integration in teaching for engaging 21st century learners at university level.

The Moderating Role of Organizational Performance Linking Human Resource Management and Outstanding Outcomes in an ODL Context

Maximus Gorky Sembiring and Rizki Hersada Sembiring

Universitas Terbuka

Gayuh Rahayu

IPB University

Conceivable factors in human resource management, organizational performance, and outstanding outcomes in an open distance learning (ODL) context were explored in this inquiry. It was aimed at exposing the moderating role of organizational performance between human resource management and outstanding outcomes (excellent service, quality product, and reliable system). It was also of interest to observe how, and in what manner, the factors engaged interrelated with one another.

This study used a mixed-method approach, with an exploratory design (a qualitative approach first, followed by a quantitative series). In the qualitative stage, human resource management was conceptually limited to selection and recruitment, work definition, the training programme, performance measurement, the compensation scheme, career planning, quality assurance, and employee participation. Organizational performance with stated standards – academically certifiable, nationally reputable, and globally respectable – was influenced by human resource management. The organizational performance affected the outstanding outcomes. In the quantitative stage, human resource management, organizational performance, and outstanding outcomes were operationally referred to as the so-called independent, moderating, and dependent variables respectively. The population was 631 faculty members at Universitas Terbuka, Indonesia.

With a simple random sampling technique, 158 questionnaires were finally completed. Using structural equation modelling (SEM), eight out of 11 hypotheses scrutinized were statistically validated by the analysis. Career planning was the most significant influence, followed by the compensation scheme, the training programme, employee participation, and performance measurement, while selection and recruitment, work definition, and quality assurance were invalidated by the analysis. The organizational performance had effects on a reliable system, service excellence, and a quality product. Also, imitated importance-performance analysis (IPA) and the customer-satisfaction index (CSI) showed that 18 out of the 27 attributes were the critical pillars of human resource management and organizational performance.

Despite the existence of trivial deviations, the study was able to visualize the inner role of organizational performance in moderating human resource management towards outstanding outcomes. However, an auxiliary comprehensive analysis was then required to uncover the grounds and then reduce the conceivable discrepancy encountered. This is done by probing more applicable methodologies, supplementing hypothetical analysis, and/or particularizing the sample size of the population sample.

Perceptions of Students and Teacher towards the Effects of Within-class Ability Grouping: A Case Study



Chenxi Wang

Beijing Normal University-Hong Kong Baptist University United International College

With the increasing number of students taught in class and their diverse educational background and ability level, classroom teachers are facing difficulties and challenges in promoting effective and active teaching and learning. Within-class ability grouping, which refers to grouping students into several sub-groups within the class according to their ability levels, has been considered as an effective way to solve this problem. The purposes of the current study are to investigate how within-class ability grouping has been implemented in one class in a middle school in Zhuhai, China; to explore the overall perceived effects on students and teacher of this grouping arrangement; and to examine the differences in perceptions of the effects of grouping on their learning between students of higher and lower levels of ability.

An Internet-based questionnaires and phone interviews were conducted. Sixty-one students and one teacher answered the online survey that was devised using a 5-point Likert scale and can be categorized into two themes: perceived benefits for students' learning and perceived problems for the emotional wellbeing of students with a lower ability level. Four students and one teacher participated in the phone interviews. The interviews were semi-structured and there were three main themes: implementation of within-class ability grouping, and the perceived benefits and problems of within-class ability grouping.

It was found that both homogeneous and heterogeneous within-class ability grouping methods were adopted. The quantitative results showed that both students and the teacher had an overall positive perception, while the qualitative analysis revealed some concerns about the widening academic gap between students of higher and lower ability; the negative effects on the emotional wellbeing of students with a lower ability level; and inflexible grouping placement. Both higher ability and lower ability students showed equally positive attitude towards the effects of within-class ability grouping on their learning.

This study has implications for teaching. Within-class ability grouping could be adopted in the classroom to deal with the heterogeneity of students' learning needs and ability levels. The grouping method was found to be beneficial to students' learning, especially enhancing their understanding, boosting their motivation, and improving their academic performance. However, concerning the perceived problems revealed in the current study, teachers should pay more attention to the emotional wellbeing of students with lower ability, adopt formative evaluation together with summative evaluation, and check grouping placement regularly.

A Study on the Factors That Contribute to the Growth of Idea Generation Ability in Design Education



Oustamanolakis Mike

Hong Kong Polytechnic University

This paper explores the perceptions that design educators have regarding the development of idea generation ability in students at design schools.

Thirty-six factors that affect idea generation ability were identified through a literature review. These factors were plotted on a survey and were distributed to design educators (n=104) around the world. Each survey participant was asked to select the five most crucial factors.

There were three factors that were selected by more than half of the participants: independent thinking, possessing high levels of curiosity, and being able to make connections between seemingly unrelated ideas. On the contrary, four factors – analytical skills, not being afraid of the unknown, the sense of autonomy and being able to elaborate on ideas – were not selected by any of the participants.

This original study revealed an overall preference for given factors that influence the development of idea generation ability. It provides a better and more focused understanding of what factors can foster idea generation ability and sets the foundation for further studies to follow.

Teaching Soft Skills at University: A Dichotomous Thinking Approach

Peter Carter, Etsuko Kakimoto and Kaori Miura
Kyushu Sangyo University

Mat Asser
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“Soft skills” is a term employed to describe the quality of a person’s ability to communicate as part of a team or organization. As a high degree of soft skills frequently correlates with better employment prospects, many tertiary institutions seek to inculcate an appreciation of soft skills in their students. Instructors at one private university in Japan adapted Kahneman’s ideas on fast and slow thinking for use in a one-day seminar in which students undertook focused practice in using soft skills. In Kahneman’s conception, human thought is a dichotomous affair with two modes: *System 1* describes fast thinking, which is instinctual and emotional, while *System 2* refers to thinking which is logical and deliberative. When asked to perform under pressure, many students employ System 1 over System 2, which can lead to suboptimal use of communication skills. The purpose of this paper is to show an example of an attempt to improve students’ soft skills through a focus on fast and slow thinking approaches.

A one-day seminar experience was undertaken by six second grade university students. Limiting the number of participants allowed instructors to facilitate small-group discussions, and provide high-quality, individualized feedback. The seminar consisted of a warm-up, a poster presentation, a PowerPoint presentation, pair work, a discussion in groups of three, and a negotiation activity comprising all six members. A balance of well-structured and ill-structured tasks was used. Teacher and peer feedback was given contemporaneously, with a second, more detailed level of feedback produced by instructors after the seminar’s conclusion. In addition, a survey was conducted at the end of the seminar to capture the participants’ perceptions.

General findings from the seminar included strongly positive appraisals of the event from its participants. With regard to the tasks, students tended to depend too much on System 1 thinking, which had a negative effect on their use of soft skills. Specific feedback produced on the day related closely to improving visual or vocal aspects of communication, while the follow-up feedback mostly showed how verbal areas could be better in order to demonstrate System 2 thinking and in navigating ill-structured tasks.

Originality/value/implications – This study shows that there is clear value in making students aware of the connection between soft skills and fast and slow thinking. Furthermore, the activities detailed in the paper provide the reader with examples that can be adapted for use in a range of contexts.

The Influence of Different Collaborative Peer Assessment Strategies on Learning Achievement and Higher-order Thinking Tendency

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In the past, research has shown the important value of information technology in education. Making good use of information technology to support their teaching is one of the essential skills for pre-service teachers. Peer assessment learning strategies have been widely used in teaching and have achieved positive results. Previous studies have focused on: (1) peer assessment learning strategies for learning achievement, but less on higher-order thinking; (2) ordinary classroom teaching, but less on pre-service teacher classroom teaching; and (3) a common learning environment, but less on a collaborative learning environment. Therefore, this study explores the impact of a collaborative peer scoring approach and a collaborative peer commenting approach on normal, self-efficacy, and higher-order thinking ability.

The participants were pre-service teachers in a Normal university in China. A quasi-experimental design was used. There were 50 students in the control group, and they used the collaborative peer scoring approach to learn. The experimental group involved 48 students who used the collaborative peer commenting approach to learn. Learning achievements were evaluated on teaching video production, and self-efficacy and the tendency for higher-order thinking. Internationally recognized scales were adopted with high reliability and validity, including scales for self-efficacy, critical thinking, problem-solving tendency, communication tendency, and a collaboration tendency.

The experimental results showed that the effect on students’ learning achievement of the collaborative peer scoring approach and the collaborative peer commenting approach was not significant in the collaborative learning environment. Further analysis showed that, for students with high self-efficacy, the collaborative peer commenting approach was more effective than the collaborative peer scoring approach in improving student achievement. In addition, we found that the collaborative peer commenting approach was more effective than the collaborative peer scoring approach in terms of self-efficacy, critical thinking tendency, problem-solving tendency, and communication tendency.

Future research can consider the impact of different group designs on evaluation results.

English Writing through Drama with Process-writing and Collaborative Approaches: A Case Study in Hong Kong

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Various temporary funds have been allocated to Hong Kong primary schools to address the scope for English Language acquisition (ELA) with poetic and dramatic approaches; and many of these extra funds have been cut at the end of the 2010s. This new element in the Hong Kong primary English curriculum is not as crucial as in the secondary sector where the authority has declared it compulsory. Its feasibility and application for primary English education should be further emphasized through various research outcomes in order to seek resources for future development. On the other hand, students with low socioeconomic status (SES) in Hong Kong are disadvantaged in English learning which will significantly affect their mobility within the social hierarchy in the long run. It is important to find out to what extent the more interactive and integrative teaching approaches mentioned above can contribute to the ELA.

This action research was conducted with another voluntary programme called *English Writing through Drama* to teach 16 students with low SES from Primary 5 and 6 in Hong Kong to address the above issues. This project aims to verify the outcome from the research subjects through understanding their academic performance and self-reflections (through questionnaires) during and after the programme.

The findings from both students' reviews and results matched and showed moderate progress in academic performance but a major increase in learners' motivation and creativity. The research also illustrated that such approaches help very significantly in authentic language learning which can also be paralleled with communicative learning teaching (CLT) – and this not only occurs between the teachers and students but also among the students.

Starting an intensified English drama programme does not mean the end of the entire curriculum. Action research should continue on this path to evaluate, implement and revisit this area for better lessons, programmes and curricula.

Impact of Teacher Presence on University Student Motivation

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Teacher presence has long played a crucial role in influencing students' engagement and motivation, in both traditional and online teaching and learning. The concept of teacher presence combines teacher immediacy (behaviours that increase psychological closeness between teachers and students) and social presence (the quality of communication media influencing the communication between teachers and students). In an online learning environment where the teacher is not physically present, teacher presence should be re-examined to explore the kinds of instructional strategies that may be effective in facilitating students' education. This study, therefore, aims to examine the impact of perceived teacher presence in an online class on student motivation.

A survey is to be conducted among an entire cohort of students (12 in total) pursuing a one-year Master of Arts in Translation (Business and Legal) in a self-financed university in Hong Kong. A questionnaire is used to measure student perceptions of teacher presence, especially in terms of teacher immediacy and social presence.

This study expects to establish whether there is a significant correlation between teacher immediacy and social presence. It also seeks to identify which concept is the greater contributing factor, in relative terms, to the concept of teacher presence in an online class. Furthermore, it aims to find out which forms of teacher presence could constructively enhance student motivation in an online setting.

This study hopes to add to the limited literature related to teacher presence, especially in the emerging area of online education. It also explores ways teachers can enhance student motivation and learning in online classes. This study is also unique in two ways: first, the entire student cohort had had face-to-face education in their first semester and also the first two weeks of the second semester, before the university adopted the online learning mode; and second, the majority of the participants (8 out of 12) took their online classes in their homeland of mainland China. Therefore, their learning history, the different learning modes within the same study programme, and the ensuing physical and/or technological constraints make this study unique.

Navigating Student Expectations in Online Design Knowledge-building

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Contrary to the steadily growing literature on online learning, the number of publications on online design learning has been consistently lagging behind. Design learning has traditionally been deemed a face-to-face endeavour with serious reliance on visual and aural cues and gestures during interactions. Nonetheless, the very recent impact of Covid-19 pressured design colleges to employ online learning, impelling the instructors to utilize this long dismissed methodology. However, the impending problems cannot be easily addressed with improvised quick solutions based on interpreting teaching evaluations and occasional student interactions.

This study aims to propose a set of guidelines for online design knowledge-building based on an in-depth look at student experience, impressions, and remarks on an online *Materials & Finishes* class that took place during the summer of 2019. This hybrid course consisted of a variety of components, spanning from lecture modules for building a theoretical knowledge base, to participatory modules for forming analyses based on the newly acquired foundation, and, lastly, further utilizing this knowledge to specify materials, not only for creative problem-solving but also expressing design intent as well as addressing sustainability, health, and safety concerns.

Data were collected through a series of semi-structured focus group interviews with the enrolled students. A 20-item survey was applied to inform the interview structure and stimulate conversation. The resulting 55K-word transcription was interpreted through iterative thematic analysis, and prominent patterns were collated into preliminary categories, eventually revealing the following overarching themes: (1) flexibility and convenience; (2) managing self-pacing issues; (3) a formal conversation platform; and (4) individualized feedback and backtracking accumulated knowledge.

Especially during the summer semesters, design students tend to work as an intern or at architecture/design offices. The participating students expressed appreciation for asynchronous alternatives to various activities as blocking time created issues and stress. Furthermore, providing incentives for participation in synchronous activities with small bonus credits was viewed very favourably by the students. However, the cost of flexibility was self-pacing issues. Students proposed a visual timeline to help them to follow the course process and they appreciated personal e-mails when they started to fall behind. They also appreciated Canvas LMS as a formal conversation platform with their peers, as they remarked that they put

in a lot of effort to crafting replies and feedback as opposed to their more direct and less careful replies on platforms such as WhatsApp and GroupMe. The students appreciated quick individualized design feedback, but also collated peer feedback that provided further direction. Following the progress of others' projects and learning from peers' mistakes were considered very valuable. However, if the organization of this information considered crucial is left unorganized as a pile, student might end up paying minimal attention.

Based on the findings, this study proposes a guideline for online design knowledge-building. It is expected that the guideline will be part of a foundation that will be highly valued considering the very possible surge in published research on online design learning in the post-Covid-19 landscape.

The Design of Open Education Resources for Engineering Students Based on the Working Process

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The benefit of distance education for engineering students is that it increases their preparedness for work. Also, the teaching aim is focused on improving their vocational skills. How to use modern distance teaching methods to construct task-centred “learning situations” and design open education resources (OER) systematically is an important research topic for distance educators.

The design steps in OER for engineering students are as follows. Firstly, the learning contents are analysed to construct task-centred “learning situations”, and typical work tasks are the carrier of knowledge; and then the learning contents are constructed according to their development of professional ability. Secondly, the relationship between knowledge and the teaching media is analysed, and different teaching media and knowledge modules should be integrated based on different teaching content. Lastly, learning activities are designed properly, as the interaction and feedback on learning activities are important factors for assessing learning effects.

In this paper, a typical engineering course, *Electromechanical Control and Programmable Logic Controller Technology* was selected as an example for discussing the general method for designing OER based on the working process. The contextualization and active construction of resource content were completed, while several small subject learning units were constructed for a different working process. Then the OER were developed based on different teaching media, including print, video audio and network media. The digital, multi-terminal, multi-interactive OER for the course were formed. Also, the learning activities were interspersed in the OER, and the specific working tasks were also carried out with the learning activities.

The working process and distance learning were integrated to develop OER for engineering students. Contextualization and active construction of resource content is suitable for adult learners and is close to engineering technology, while the choice of teaching media based on the knowledge module is suitable for engineering courses and distance education. The method for designing engineering OER is a useful attempt to use distance education theory and teaching concepts, and also reforms the traditional teaching mode.

Reacting to the Coronavirus: A Case Study of Science and Engineering Education Switching to Online Learning in a Sino-foreign Higher Education Institution

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On December 31, 2019, the Chinese office of the World Health Organization (WHO) received the first reports of a previously-unknown virus allegedly behind a number of pneumonia cases in Wuhan, in the People's Republic of China. The University of Nottingham Ningbo China (UNNC) is a Sino-British campus situated in Ningbo, about 700km from Wuhan, with a student population of approximately 8,000 domestic and international students. Due to the restrictions placed on travel both within and external to China, the UNNC reacted quickly to ensure that the quality of teaching and learning (T&L) was upheld, and that students would meet their credit requirements to progress and/or graduate on time. This paper reports on an ongoing study examining some of the major challenges faced when adjusting from traditional face-to-face teaching methods to the necessary online/remote teaching methods used within the Faculty of Science and Engineering (FoSE) at the UNNC due to the sudden outbreak of the novel coronavirus, Covid-19, within mainland China.

Through a series of surveys, observations and interviews with both teachers and students during the intervention, this study aims to identify both successful and less than successful strategies. Given that many subjects within FoSE are practical, often requiring hands-on interaction with specialised equipment, a goal of the study is to understand how the staff and student T&L experience was affected when students were unable to access the campus laboratories, studios, and other necessary materials and equipment.

The preliminary findings of this ongoing study indicated which online/remote teaching methodologies appeared most suitable for the teaching of practical workshop-based subjects that include laboratory experiments, free-hand sketching, model-making, prototyping and testing, project-based learning, and CAD modelling. The findings will provide both guidance and understanding on the challenges and successes that can occur when switching from traditional face-to-face teaching to online/remote teaching methods, both from the teachers' and the students' perspectives.

This is the first time that a Sino-British campus within mainland China has encountered this scenario – namely, a large number of teachers experienced in traditional classroom-based T&L suddenly having to adopt and adapt to distant experiential learning. This study provides insight into the major challenges and successes that occurred during the sudden switch of instructional setting. The

outcomes of this study aim to aid the larger teaching community when adopting online methods to augment their teaching while mitigating the potential negative impacts on the students' T&L experiences.

To Pass or Not to Pass? How Are Open Universities and Students Coping with the Covid-19 Pandemic?

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The declaration of an enhanced community quarantine to address the Covid-19 pandemic in the Philippines on March 17, 2020 put the educational system in a bind. Higher educational institutions in the Philippines implemented policies that pushed for suspension of classes with very strong recommendations for online learning. The University of the Philippines Open University was exempted from the suspension of classes, but extended the semester until May 9, 2020. In addition, the grading system applied for the semester included several options, such as dropping out without penalty; the extension of deadlines; the total cancellation of the second semester, giving a second chance; and mass promotion. However, students were not asked for their opinions on this grading system. This study aims to get the students' responses to the grading options presented. Furthermore, the survey also assesses how students were coping with the current pandemic and identified what they expected from the UP Open University.

A survey questionnaire was administered via Google Forms to all 191 students currently enrolled on the Master of Environment and Natural Resources Management. Eighty-five students answered the questionnaire.

Sixty-five percent of enrolled students preferred to continue with the course, with 91% supporting the extension of deadlines for course requirements. Seventy-nine percent opposed the total cancellation of the semester, while 45–48% were in favor of mass promotion. It was found that working and studying from home had been challenging for students since Internet access was not always steady and available. Also, students felt that assignments could be modified or reduced considering the limited access to people for surveys or interviews. Extension of the deadlines, and regular communication and updates from teachers were expected by the students. Finally, students suffered from anxiety and stress, and resorted to various ways of coping with it.

This study was important for determining students' preference for how their performance in class was to be evaluated, considering the limitations implemented in the Covid-19 community quarantine. While the learning mode in open universities can be described as the best way of learning in a pandemic, one must recognize that, during the pandemic, teachers and students faced the reality of restrictions, limited mobility and stress/anxiety. Most of the available research studies are focused on the transitions from face-to-face to online learning.

Suspending Classes without Stopping Learning: How Emerging Educational Technologies Facilitated Online Learning for OUHK Teachers and Students during the Social Unrest and Covid-19 Pandemic

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Since June 2019, what began as peaceful demonstrations escalated into a series of mass protests and violent confrontations across Hong Kong. The six months of social unrest have resulted in significant civil disruption, including the closure of schools and cancellation of classes at higher education institutions. With the suspension of classes since November 2019, the Open University of Hong Kong (OUHK), along with all other local universities, has abruptly changed its delivery mode for its face-to-face (F2F) students to fully online learning. After a few fleeting moments of peace at the start of 2020, the city faced another blow from the outbreak of the coronavirus. This has led to the suspension of F2F teaching since February 2020, which has been replaced by online learning. This paper investigates how emerging educational technologies have enhanced and facilitated teaching and learning for academic staff and students at the OUHK during these unexpected circumstances over the past eight months, and for the entire 2019–2020 academic year.

This paper discusses the adoption of various technologies to enhance online learning and teaching, including asynchronous learning and synchronous learning. The study involved two sets of online questionnaires that were administered to teachers and students. Descriptive and regression analyses were used to determine the significant factors that affect the effectiveness of teaching and learning, as well as users' satisfaction.

Overall, the survey results indicated that teachers were generally satisfied with the features of OLE for teaching; students were satisfied with the features of iBookcase for learning; and both teachers and students were satisfied with Zoom real-time classes. Among the variables of these three main educational technologies carried out by linear regression models, the independent variables (with a p value < 0.05) tend to have a close relationship with their influence on teachers' and students' overall satisfaction.

The results of this study have implications for the convenience and easy adoption of technology-enhanced tools and activities for teaching and learning. In the past, technology was mainly applied to large-scale systems or applications such as the learning management system, where students can participate in discussions and submit assignments. In these unexpected circumstances, teaching staff and students easily accepted the changes in the conventional teaching and learning mode and were inclined to integrate online learning technologies into their teaching and learning.

Educational Responses of Anadolu University Open Education System during the Covid-19 Pandemic

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Most of the higher education institutions around the world have closed due to the outbreak of the coronavirus (Covid-19). While these closures have had an impact on millions of students across the globe, Anadolu University's open education system – one of the world's largest distance education providers – gave a quick response to the disease and arranged its resources and applications to decrease its negative effects. As a response to the pandemic, this mega university, with over one million students from all over the world, launched an online examination platform and gave an opportunity to its students to take the spring semester mid-term examinations online without postponement in the academic calendar under the mandatory lockdown. The present study attempts to introduce the educational responses of Anadolu University's open education system in this time of sudden and unprecedented difficulty.

The present study focuses mainly on the educational response – an online examination – arranged by Anadolu University's open education system. A quantitative descriptive research approach was adopted to describe the practice of the massive online examination with regard to the open education system.

This is an ongoing study, the findings of which are expected to highlight important issues related to massive online examinations and efforts to mitigate the impact of the pandemic. Also, the paper aims to share the experience of the university in developing more flexible educational applications.

Anadolu University's open education system quickly planned some educational solutions in response to the Covid-19 disease, one of which was the application of an online examination. Even though there are many concerns related to online examinations, postponing these large-scale examinations may have resulted in increased costs. In lieu of the normal arrangements, distance education providers can move to online examinations not just during the pandemic but also in the long run. However, given the critical role of online examinations during this unprecedented time, future research is needed on how preventive measures can be taken against cheating.

Addressing the Challenges of Online Teaching at the Time of the Covid-19 Pandemic: A Case Study of the OUHK Business School

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The recent outbreak of the Covid-19 pandemic substantially disrupted every aspect of our lives, and education was no exception. This qualitative case study investigates how the pandemic affected teaching in the Lee Shau Kee School of Business and Administration at the Open University of Hong Kong (OUHK, B&A School) and shares the lessons learned and experience in successfully addressing the challenges. This paper aims to identify the critical success factors and best practices in implementing online teaching and advocates a methodology for devising a flexible teaching plan for higher education institutions. Other practical issues and concerns, such as group activities, student participation, and assessment are also discussed.

This preliminary study adopts a qualitative approach for investigating the impact of the changes from the perspective of the academic staff. By reviewing the global situation in higher education, this paper first highlights the barriers and problems commonly encountered in abrupt changes of the teaching mode and adopts a qualitative content analysis which involved conducting in-depth interviews with OUHK B&A academic staff who taught various levels of undergraduate courses in 2020. A flexible teaching strategy was then devised to combat the challenges based on a SWOT analysis for the OUHK B&A School.

The challenges are diverse and include several dimensions. A unified approach is necessary in preparing for a long-term flexible teaching strategy that can achieve the intended learning outcomes in the uncertainty of the Covid-19 pandemic. The use of educational technology is of paramount importance for facilitating online teaching; and online platforms should also be developed to support teaching and learning. In addition, academic staff and students may not be fully prepared for the changes in the teaching mode, and so further training should be provided.

The expectations of students and teachers have been changed after experiencing online teaching. It is predicted that, in the near future, conventional face-to-face teaching and online learning are likely to be integrated to a new level to enable student-centric and blended learning. This paper provides a concrete case study on how online teaching can be seamlessly integrated into higher education. The critical success factors, best practices and pedagogical guidelines are discussed for the successful implementation of online teaching in higher education institutions.

Microlearning in Technical and Vocational Education and Training (TVET): A Case Study during the COVID-19 Outbreak in Hong Kong

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Technical and vocational education and training (TVET) is expected to play a crucial role in the sustainable development of tomorrow's knowledge economy, as it empowers individuals with skill-development, and promotes employment through offering an alternative educational pathway. The recent COVID-19 pandemic has presented challenges to Hong Kong's TVET teaching staff, including that campuses have been closed, removing face-to-face instruction options. However, this crisis situation has also presented unique opportunities to create a "tipping point" or conditions that foster innovative teaching practices. In light of these developments, a new form of e-learning, *microlearning*, has recently been explored by a Hong Kong TVET institution. Microlearning offers learning opportunities through small bursts of training materials that learners can comprehend in a short period of time, according to their preferred schedule and location. Originally considered as "add-on" complementary online learning resources, to provide learners with an active and more engaging learning experience through flexible learning modes, the possibility of an institution-wide implementation of microlearning has been further explored during the COVID-19 lockdown. This paper examines the Hong Kong TVET institution's approaches to the adoption of microlearning.

We present a case study of a Hong Kong TVET institution's approaches to the adoption of microlearning. More specifically, a student questionnaire was used to gather Engineering students' (n=496) feedback on the microlearning experience.

Overall, microlearning appeared to be a promising direction for Hong Kong's TVET, but its current implementations face challenges and its role may remain supplemental.

The insights gained from examining how a TVET institution can move toward adoption of microlearning, with its promise and challenges, will contribute useful knowledge to TVET and other institutions attempting a similar adoption. The strategies discussed in this paper will help Hong Kong TVET institutions to fully take advantage of the opportunities of microlearning, and to address challenges for implementation. This study will also be of interest to online delivery and flipped classroom advocates.

The Relationship among Different Types of Students' ICT Use, Their Academic Achievement, and the Country-level Economy Index: A Multilevel Analysis

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The purpose of this study is to probe the relationship between ICT-related factors and students' academic achievements and the moderating effects of country-level economic factors on their relationships.

Two-level hierarchical linear models (HLM) were employed to investigate both student-level and country-level variables, using the PISA 2015 data on ninth-grade students across 39 countries. The student-level ICT-related factors included ICT use for studying at school; ICT use for studying at home; ICT use for entertainment; students' interest in ICT use; students' perceived ICT competence; and students' perceived ICT autonomy. At the student level, gender and family socioeconomic status were included as control variables. At the country-level, we utilized the 2015 GINI index of each country when creating the GINI index variable.

The findings indicated that (i) students' interest in ICT and students' perceived ICT competence had positive impacts on students' academic performance; (ii) students' perceived ICT autonomy had the largest positive impact on students' academic performance; (iii) students' ICT use for studying or entertainment showed negative associations with all maths, reading and science achievements; (iv) the GDP per capita had minor or no significant interaction effects on the relationship among ICT-related factors and students' academic performance; (v) the relationship between these ICT-related variables and students' academic performance was stronger in countries with higher income inequality than in other countries; and (vi) the higher level of students' perceived autonomy in ICT resulted in better learning outcomes in countries with less income inequality.

This study contributes to the education field by conducting a multilevel analysis of the relationship between student-level ICT factors and students' academic achievement, and the moderating effect of national-level economic indices on these relationships. The results indicated that students' ICT use for both studying and entertainment had a negative association with their academic achievement, but interest, perceived competence, and autonomy in ICT use showed a positive impact on students' learning. The results also suggested that the effects of ICT-related factors on students' achievement should be interpreted carefully in the context of national-level income inequality, and further action to mitigate the income inequality in a country can weaken the achievement gap due to ICT factors.

Employing a Technologically-assisted Teaching and Learning Strategy in the English as a Foreign Language Classroom: The Application of the Visual-only Video Teaching Strategy

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English language teaching and learning is one of the hottest topics in the current South Korean educational environment, particularly for undergraduate nursing students who need to master at least one foreign language for potential career development and daily operation. The current pilot study aims to get feedback from a group of first-year nursing students with intermediate- to advanced-level English language proficiency on the use of the *Visual-only Video Teaching Strategy* as the tool for the teaching and learning of English as a Foreign Language.

The researcher employed the *Visual-only Video Teaching Strategy* as the major teaching and learning tool for instructing an English language course for a group of nursing students (N=13) during the 16-week semester. In brief, the *Visual-only Video Teaching Strategy* encouraged teachers to merge pictures and materials into videos as the instructional tools. After the completion of the English language course, each student was invited for a face-to-face, semi-structured, and private interview to share their thoughts and ideas on the application of the *Visual-only Video Teaching Strategy*. In order to reduce possible bias, the interviews were held after the researcher had entered the grades into the computer system, and before the students could access their grades.

There were two important results. The participants advocated that the *Visual-only Video Teaching Strategy* could successfully connect the textbook knowledge and exercises to the workplace and real-world environment. First, based on the nature of the *Visual-Only Video Teaching Strategy*, the tailor-made videos and pictures captured from the students' living communities increased their motivation and interest in learning the English language. Second, the *Visual-only Video Teaching Strategy* also encouraged the application of the social media platform as the discussion forum for sharing and exchanging. All the participants claimed that, after the completion of this course, they were able to apply the textbook knowledge and conversation skills to their nursing major and practices for other courses, placement, and career development.

The results of this study provided an alternative and innovative teaching and learning strategy beyond the traditional teacher-centred and top-down teaching and learning approaches in the current East Asian educational environment. Also, the development of the *Visual-only Video Teaching Strategy* always encouraged the notion of living communities' connection and application of social media platforms as the teaching and learning tools for undergraduate students.

Quizlet: The Effect of Mobile Applications on L2 Vocabulary Learning



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The traditional paper-based learning and teaching methods always make vocabulary learning a boring and time-consuming process, while the rapid development of technology in recent years provides some new opportunities and possibilities for improving it. Therefore, this study aims to investigate the effectiveness of using a mobile application, Quizlet, in the context of L2 vocabulary learning, and to find out participants' attitudes towards this learning method. The relationship between participants' attitudes and their test scores is also explored, in an effort to demonstrate that it is important to use creative methods to arouse students' interest and motivate them to learn.

This experiment was conducted in Beijing Normal University-Hong Kong Baptist University United International College (UIC), which is an institution of higher education in China. There are three main stages in this experiment: a pre-test which aimed to select the target vocabulary for the following process of learning and testing; a post-test which was conducted immediately after the treatment; and, finally, a delayed test that was implemented one week later to find out the longer-term effects. A total of 44 participants were divided into an experimental group and a control group. In the experimental group, Quizlet was used as the learning tool, while participants in the control group were only given hardcopy texts of the same vocabulary learning materials. Specifically, a questionnaire was designed for participants in the experimental group, which contained ten items and was given during the delayed test.

The data collected in this experiment showed that the use of Quizlet as a mobile application for study improved students' competence in vocabulary learning. They were able to memorize more vocabulary items quickly and for a longer time. Also, the results from the questionnaire indicated that participants had positive attitudes towards using Quizlet to learn vocabulary, but they had different opinions about the usefulness of Quizlet in the classroom. Moreover, analysis of the relationship between learners' test scores and attitudes revealed that there was a strong and positive correlation between them.

The findings in this study may encourage ESL or EFL teachers to consider teaching English vocabulary in the form of mobile application games or at least to combine them with traditional hardcopy texts. Learners may also be

motivated to try different mobile applications in order to promote their L2 vocabulary acquisition.

E-Exams: Assessing the Next Generation

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A shift in the education paradigm involving digitalization has been observed and the need for e-exams in tertiary institutions has been proposed. e-exams allow educators to create and deliver assessments with enhanced levels of security and utilize richer media. E-marking offers automatic scores tabulation and expedites analysis of students' performance, thus increasing efficiency.

This paper aims to share the approach to the implementation of e-exams using a SAMR model with Bring-Your-Own-Device (BYOD) and the impact on students' performance and perceptions.

The SAMR framework classifies four different levels of classroom technology integration, namely Substitution, Augmentation, Modification and Redefinition.

The challenges faced in conventional assessment include the waiting time with multiple markers and delayed student feedback. Identifying the challenges, the School of Health Sciences embarked on e-exams in 2016, starting from formative e-assessments to e-tests and eventually high-stake e-exams.

The School initiated e-tutorials (Substitution in the SAMR model), addressing the issue of inadequate student feedback and analytics on students' performance. Next, it proceeded to e-tests for ~230 students, providing more authentic assessment experience through a shift in assessment design (Augmentation). The figure increased to ~ 650 students, with >25 assessments in 2019. There were also alterations in lesson design (more remote learning) and simultaneous marking was implemented, bringing greater integration of technology in education (Modification). The School is now working towards the pinnacle in the SAMR model (Redefinition), where e-assessment can transform the experience, mimicking real-life situations.

Shifting to e-assessments can potentially influence students' experience and performance. This presentation will share the preliminary findings based on a user experience survey with Diploma in Nursing students (NSG) and the academic performance of Diploma in Optometry students (OPT).

NSG–Year 1 Module

The result from the 38-item quantitative learner survey (n=239) were as follows:

- 61% of the learners were neutral/agreed that there was greater ease in reviewing answers prior to the submission of e-papers.

- 76% were neutral/agreed that the e-assessment system was reliable against technical failure.
- 78% were neutral/agreed that the system was secure against cheating.
- 71% were neutral/agreed that the nature of the assessment suited the use of a laptop.
- 85% were neutral/agreed to the idea of using their own laptop for the assessment.
- 84% were neutral/agreed that the overall e-assessment experience was positive.

OPT–Year 1 Modules

The difference between the mean scores obtained from traditional pen-and-paper assessment and e-assessment was statistically significant on certain assessment components

Confounding factors such as assessment difficulty should be considered in future research.

This study provides insights and recommendations for the future design and implementation of e-assessments, the potential impact on students' feedback and performance, and validation of the e-assessment survey tool. This in turn highlights the training needs for staff and student in preparing for e-assessment.

The Effectiveness of Team-Based Learning for Third-year Diploma in Nursing Students

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Ngee Ann Polytechnic

The effectiveness of TBL pedagogy is well-recognized in health professional education (Parmelee, 2008) for facilitating a student-centred and structured learning process. The content is delivered via pre-class activities, eliminating the need for the traditional lecture (Mennenga, 2012). The class time is used to run individual and team tests (IRAT and TRAT) and peer discussion.

Evidence indicates that TBL promotes active learning, positive learning attitudes, and class engagement; and it improves problem-solving, critical thinking, teamwork and communication skills (Frik, 2004; Siah et al. 2019). While TBL is widely applied in university learning, this pedagogy is a new experience for the Diploma in Nursing students at Ngee Ann Polytechnic where the students are younger. The educators and students may be apprehensive about TBL due to fear of losing control in the classroom and of a negative impact on academic performance

The purpose of this study is two-fold: (1) to evaluate the nursing students' perception of the TBL approach, and (2) to analyze the effectiveness of TBL using common test results.

The participants experienced TBL and traditional learning (TL) alternately and sat a common test at the end. They completed a 29-item questionnaire that covered students' perception of the individual readiness assurance test (IRAT) and the team readiness assurance test (TRAT); perception of learning and attitude in team-based discussion; and a comparison of preference in TBL vs TL. Next, the analysis compared the common test results of April 2019 (with alternating TBL and TL) with the April 2018 results (only TL).

An independent samples test comparing attitudes vs learning in team discussions showed that students' perception of attitudes (accountability, confidence, engagement, mutual respect in a team) was favourable compared to their perception of learning (TBL activities were fun, and small group discussion was viewed as better than the class setting in the team-based discussion). We also analyzed the correlation between responses on IRAT and TRAT, which was significant at .758. Students also felt that the TRAT was valuable for learning and they preferred TBL compared to TL. Finally, the analysis of the common test results showed that the median score increased by 7.9% compared to the previous semester (TL only).

Students perceived that TBL promotes accountability, confidence, engagement and mutual respect. We aim to embed TBL into more modules to achieve quality outcomes of holistic development of graduating nurses. Also, using real-time tech-enabled learning approaches in an integrated manner is a key design competency for educators.

Enhancing the Knowledge of Chinese Orthography in Junior Education

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Nowadays, a lot of Chinese typos can be found on the streets and many of them are ignored without people being aware of them. Junior education students are at the stage of building up their word bank, and would easily feel confused by such Chinese typos. "aMAZEing TYPOS" is a maze-escaping game which incorporates questions. The questions are based on the Chinese typos that are commonly found in daily life. For their long-term development, students need to improve and raise their awareness of using common Chinese orthography. It focuses on the words that Hong Kong students very often mix up. Three categories where people easily get confused – namely "pronunciation" (e.g. 儘vs盡), "meanings" (e.g. 須vs需) and "shape" (e.g., 鼓vs鼓) – are included. The project was initiated because awareness and knowledge of Chinese orthography in junior education has reduced in Hong Kong and it is easy for students to become confused by the Chinese typos found in their daily life.

A mobile educational game was developed on the Android platform. This game involves escaping from a maze that has quiz questions. Players need to answer all the questions correctly in order to escape from the maze and complete the game. Cloud technology (with Firebase), database manipulation (with SQLite) and 3D animation are applied and integrated with the development tool Unity Engine. For testing and evaluation, a prototype system has been developed and experiments have been carried out to test the learning effectiveness.

Findings – The results of the experiment illustrated that the gamification of education can enhance students' awareness of writing orthography and correct their typos. We believe that enhancing the awareness of writing orthography is a more efficient way to improve the situation of writing typos than traditional teaching.

For junior education students who struggle to identify the authenticity of traditional Chinese words, a 3D game that integrates the most common typos and aims to encourage students to rectifying their typos has been developed.

A Mobile App for Learning Java through Games

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The aim of this study is to develop a mobile application for learning Java called “Java3in1” for students to learn and consolidate their technical skills through tutorials and games. Java is one of the most popular object-oriented programming languages and is often taught in computing courses in universities. Many students find that learning object-oriented programming is difficult. Meanwhile, mobile learning is becoming popular for students studying new knowledge from the Internet with smartphones. Traditionally, most students could only attend face-to-face classes and practise Java programs in front of desktop computers which imposed geographical constraints. In addition, students usually get bored and demotivated through the traditional method as it involves repeatedly writing and debugging source codes individually with little interaction with classmates and teachers. In order to achieve flexible and collaborative learning, the objective of this study is to develop a new mobile application for students who are studying courses on Java by incorporating and integrating the course content with game elements. Besides classes, students can play the gamified Java tutorials as exercises themselves or with classmates using any of their mobile devices at any time and from anywhere.

This application provides integrated features for effective learning of Java through tutorials and games. Students can study the Java tutorials with different levels of content through interactive interfaces. With the game framework, students can further participate and play games individually or in groups with an instant review of results. For testing, a prototype system has been developed and experiments have been designed to test its functionality and usability.

A questionnaire survey was conducted. Most participants agreed that this new application can increase their interest in learning Java. They also agreed that the use of gamification techniques further enhanced the interaction between students and teachers. They agreed that the provision of different game scenarios keeps them motivated while learning programming concepts and the Java syntax with the games.

The evaluation showed that, compared to traditional lectures and online tutorials, this application can produce a greater enhancement in students’ interest in learning Java by providing entertaining gamified components. From our findings, with a mobile-device based on a serious gaming approach, the use of our application can result in more efficient and beneficial outcomes with new mobile games in teaching object-oriented programming and enhance the learning experiences of students.

Factors Affecting the Use of an Online Learning System

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Online learning has been used for decades. Owing to the COVID-19 pandemic, almost all the universities and schools were closed. Learners from kindergarten to postgraduate level have been studying at home using an online learning system from January to May 2020. Almost all the students have an extensive experience of using an online learning system, and this study investigates the factors affecting its use. Expectation confirmation theory was adapted from the consumer behaviour literature and used in this study. The continuance of the online learning system at the individual user level is an important consideration for educators.

Five research hypotheses derived from expectation confirmation theory were empirically validated using a survey of online students. The survey was administered in the online mode due to the pandemic. Focus groups were used to explore the underlying factors affecting students using the online mode. The conceptual model in this study was examined using partial least square structural equation modelling (PLS-SEM) with SmartPLS 3.0 statistical software. The validity and reliability of the measurement items were evaluated in the measurement model, and the reliability, internal consistency, discriminant validity and convergent validity were assessed using the updated guidelines by Hair et al. (2019). Path coefficients were calculated by conducting bootstrap analysis.

The major findings of the study are that online learning system users’ continuance intention is determined by their satisfaction with using the online system and perceived usefulness of continued use of the online mode. Students’ satisfaction is influenced by their confirmation of expectations from prior use of the online mode and perceived usefulness. Post-acceptance perceived usefulness was influenced by users’ confirmation level. The major findings of the study will be validated by post-focus-group results.

This research is an attempt to use the expectation confirmation model in an educational context. Bhattacharjee (2001) used this model on online banking systems, and Rahardja et al. (2019) applied it in game learning. This study paid attention to the differences between acceptance and continuance behaviours, with continuance being regarded as an extension of acceptance behaviour. An implications of the study is that offline education cannot be totally replaced by the online mode. The online education mode will be used more frequently as a supplementary format as all the teachers and students were equipped with the necessary skills. The flipped classroom format and blended learning could be the future directions for learning.

Enhancing Special Educators through an Information and Communication Technology Learning Design Paradigm: A South-Indian Perspective

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This research paper proposes a framework for engaging children with special needs through the applications of an ICT learning design. Special education in India has gained momentum in the 21st century with many innovations and curriculum enrichments. While many special educational institutes in India are pioneering the development of newer teaching-learning frameworks, it has been observed that engaging children with special needs and developing their skills and knowledge is a challenging task. Thus, the current researchers have articulated the need for engaging special-needs children through an ICT-enabled learning design. They have engaged special educational learning design strategies and shown how these can support children with special needs in the context of special schools in Tamil Nadu in South India

This study uses a mixed research methodology involving quantitative and qualitative approaches. Based on a predetermined sample size, a questionnaire survey, and follow-up interviews with Heads/Senior Executives in special educational institutes, were conducted with a view to examining and analyse the 60 aspects of ICT- based learning design and its applications among the special educators. There were 102 responses from teachers.

The analysis of the research was divided into three categories. Firstly, correlation analysis was used for individual aspects, which established strong and weak relationships among them; examining demission's of factor analysis and grouping of special educators under cluster analysis, which indicated their close relationships and similarities. The propinquities of special educators are generic, bundled, and supported by high-performing ICT-enabled learning design. The research has shown clear evidence that there are special schools which help their employees to develop and cultivate curriculum design to empower children with special needs. The findings of the cases analysed from special schools have been shown to match with quantitative data outcomes.

The findings indicated that the application of an ICT-enabled learning design among special educators is viewed in two ways: teachers with ICT skills have a higher performance, and teachers with poor ICT skills are using them sparingly. The research proposes a number of alternative approaches, namely learning-teaching design programmes, acquiring more ICT-enabled skills, and knowledge to empower children with special needs.

A Blockchain Framework for Managing Students' Community Engagement

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Blockchain technology caught the world by surprise more than a decade ago with its use in cryptocurrency and its later adoption together with smart contracts in the supply chain, logistics and many other sectors. In recent years, there have been numerous cases of it being used in the education industry for libraries, records management, transcripts and digital certificates. Community engagement has a growing importance in students' education. The purpose of our research is to explore how the features of community engagement can be integrated into a blockchain to provide an effective way of tracking students' development and looking at how to motivate them to contribute to the welfare of the community. Collaborative efforts among various stakeholders (i.e. faculty, students and community partners) in community engagement can be tracked in a more transparent manner using an immutable and highly-secure blockchain network.

This paper discusses the design of the proposed framework and the development of a basic prototype of a blockchain. Various blockchains were studied before selecting Hyperledger Composer Playground for this project. The community engagement feature was programmed and deployed on the Hyperledger Composer Playground locally with connections made to a real fabric.

Testing was carried out to ensure that data could be added to the blockchain and the smart contract could be executed properly. Our test results showed that the blockchain can be set up relatively easily; new data can be added properly; information can be queried; and a smart contract can be triggered conveniently.

From the basic prototype developed, we can see how the community engagement feature can be integrated into and used efficiently in the education sector. The value it offers is significant with its effective management of community engagement and we can look forward to expanding the basic prototype to a complete system.

Usability Assessment of a Library-associated Mobile Learning App for the Visually Impaired



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The visually impaired have to rely on visual learning tools, which makes it more difficult for them to learn than ordinary learners. Their visual defects make them step back from receiving information and learning knowledge, and even increase the obstacles they face in accessing information. This study aims to explore the usability of a library-associated mobile learning application (app) by collecting feedback from the visually impaired participants and their perceptions when they use the app to support mobile learning.

In this study, a total of eight visually impaired participants were recruited, each of whom had previous experience in using the Internet, computers, and cellphones. The experimental process was audio-recorded and videotaped. The participants' feedback and difficulties when operating the library-associated mobile learning app were also documented. The System Usability Scale (SUS) was adopted for collecting feedback on the mobile learning app, and interviews were conducted to understand the participants' learning behaviours, usage and perceptions of the app.

The findings indicated that the visually impaired participants gave a positive evaluation of the app. The learning navigation menu design of the app was the most important component for guiding them to efficiently and effectively access information and learn knowledge. Different learning modes and interfaces should be taken into consideration so as to allow visually impaired users to choose an approach which is suitable for them. Above all, this app is regarded as having great potential for mobile learning. Based on the participants' feedback, various suggestions are proposed to improve the usability of this app for learning as well as the accessibility of the learning resources.

Few of the studies on mobile learning and the visually impaired have evaluated the usability of library-associated mobile learning from the perspectives of the visually impaired. They can use this mobile learning app to learn to or read e-books (PDF or epub is supported), e-braille books, and audio books. The app provides learning resources for the visually impaired and can also enhance the usage rate and the quality and quantity of the learning services it offers; and it serves as the foundation for developing more effectively the library-associated mobile learning app for the visually impaired.

Survey and Analysis of the Online Learning on a Physics Experiment Course



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The online teaching system for the physics experiment course in Tongji University involves five platforms: the Canvas platform; the Chaoxing APP and website; the virtual experiment platform; the website of the physics experiment teaching centre; and the WeChat for physics experiments. The purpose of this study is to explore the effects of online experiment teaching based on students' views, so as to improve it and cultivate students' inquiry ability.

This research uses a questionnaire survey on students' attitudes to, and the learning effects of, the online teaching platforms for teaching physics experiments. The students who completed the questionnaire were from the physics experiment class at Tongji University. The aim of this survey is to get students' opinions and suggestions for improving the online learning and teaching platform; and the content of the questionnaire covers the relevance of the course, frequency and time, the learning effect, the degree of satisfaction, and the virtual experiment on the online learning platform. The survey was completed by 1,474 students whose majors were in science and engineering.

Analyses of the quantitative and qualitative data suggested that students have an obvious tendency to like online learning methods and have positive views on the learning effect of the online teaching of the experiment course. The online experiment course allows students to increase their perceptual knowledge of the operational process, and the working principle and scope of application of the equipment before an actual experiment; and the course enables teachers to make reasonable inductions and provide guidance to students on common errors. However, the online learning platform is dependent on technical resources or tools, which must be reliable, easy to use, and up-to-date in order to have a meaningful impact on the learning experience. In the future, the platform construction must be regularly updated to continue to provide high-quality technical support.

Online learning on the experiment course can help students to preview the contents of the experiment in advance, and choose a convenient time and place for learning. However, their views on the value and effectiveness of this online learning experiment course were individual. The students' views were helpful for finding the direction for developing the online learning and virtual experiment, enhancing the learning experience, providing student-centred, autonomous learning, and encouraging students to take responsibility for their own learning.

Comparison of the Socio-economic Status of Undergraduates in Conventional and ODL Universities

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The aim is to compare the socio-economic status of undergraduates in selected conventional and ODL universities, which is important for a sustainable education management process.

A piloted structured questionnaire with ten items was adapted to gather the socio-economic status of 400 undergraduates each from a conventional university (University of Peradeniya: UP) and an ODL university (The Open University of Sri Lanka: OUSL) in 2017. The purposive stratified random sampling technique was adopted to select the disciplines, and then the questionnaire was randomly distributed among the sample. Data were subjected to frequency and cross-tabulated analysis using the SPSS computer package.

The majority of the students in both universities were below 30 years of age, excluding law (40%) and arts/social sciences (23%) at OUSL. Also a higher number of females were registered in both cases [OUSL: science (63.3%), management (60%), arts/social sciences (76.70%); and UP: management (51.60%), law (58.30%), arts/social sciences (71.70%), except for engineering at OUSL (43.6%) and UP (40.6%), science at UP (48.4%) and law at OUSL (48.4%). Only the OUSL had married or employed undergraduates who were studying arts/social sciences (43.3%, 66.7%), law (33.7%, 63.2%), management (10%, 93.2%), engineering (8.5%, 50%), science (7.5%, 26.6%). The majority of engineering (50%) and science (45.6%) students at OUSL and arts/ social sciences (52.4%) at UP resided in village areas. Except for students of law (41.7%) and arts/social sciences (38.6%) at UP, other undergraduates (ca. 60%) had studied at popular schools.

Family members of engineering (60.4%) and science (57.9%) students at UP were graduates, while engineering (>75%) and science (70%) students at OUSL had fewer qualifications – i.e. students with a high educational background got more opportunity to enter professional fields in UP. The family members of students in management (43.3%), law (46.3%) and arts/social sciences (41.7%) disciplines at OUSL had higher educational status than their peers in UP, as well as in other disciplines in OUSL. The highest monthly family income was shown by students of engineering (58.3%) and science (53.7%) in UP and management (43.3%) and law (42.1%) in OUSL. The majority of the undergraduates studying management (58.1%), law (83.3%) and arts/ social sciences (48.8%) at UP were from the middle income category (between SLR 30,001 and 40,000). In comparison to UP, the majority of science and engineering students at OUSL were from a lower socio-economic backgrounds.

Finally, the majority of students of law, management and social/art disciplines at OUSL were married and employed, and therefore needed more flexibility in the teaching-learning process.

The teaching-learning process in conventional and ODL universities is very different, though they are under a single governing body. This research contributes to comparing their economic status, though there is still a huge knowledge gap in this area.

A Study on the Characteristics of Bachelor's Degree Awardees of the Open University of China



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The Open University of China

The Open University of China (OUC) was granted the right to confer bachelor's degree in 2015 and began to grant these degree to its students in 2016. Currently, a bachelor's degree can be conferred in 29 majors, and the number of bachelor degree recipients has reached more than 10,000. The OUC does not award a bachelor's degree directly to all its graduates – only about 1.7% of its graduates can be awarded a bachelor's degree. The bachelor's degree marks the educational and academic level of the learners, and a comprehensive and continuous analysis of the characteristics of degree awardees is an important reference for carrying out undergraduate education with a more purposeful and targeted approach.

The study of the demographic characteristics is an important aspect of the study of learners, and it is the basis for carrying out teaching reform, balancing the teaching level, and improving the quality of teaching. Using a quantitative analysis method, this paper uses data analysis and data visualization tools to analyze demographic characteristics such as gender, age, and geographic location, and learning characteristics such as specialism, and the highest academic qualification for three years before entrance for the 11,545 bachelor's degree awardees. Also, the same analysis of college graduates in the same period was made for comparison.

Those who have OUC bachelor's degree have important characteristics in terms of the proportion of males and females, age span and specialism. The overall proportion of women is significantly higher than that of men; the age span is large but is focused on relatively young people aged 28 to 30; specialisms are more concentrated; and the number of awardees is not related to the number of graduates in the distribution of district and specialisms.

These research results can provide support for the OUC to carry out its work of awarding bachelor's degrees, improve the quality for awarding these degrees and carry out graduate education in the future.

Accessing E-Resources in Local Languages for Lifelong Learning: A Study of Open Universities in India



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The open and distance learning system in India aims at the democratization of education and caters for different sections of society across the country. It has one National Open University and 14 State Open Universities (MHRD, 2020) that teach using printed self-learning materials and technology. The recent lockdown due to the Covid-19 pandemic resulted in educational institutions, including open universities, being closed, with various learner-related activities being adversely affected. In order to minimize the loss, ODL institutions initiated full-time online learning for students. This brought the focus onto the accessibility of appropriate e-study materials, support materials and other e-resources in local languages. The Indian Constitution lists 22 official languages, but there are 121 languages and 270 mother tongues spoken in different states (Census India, 2011). India had earlier adopted the "Three Language Formula" for education (Vennela, 2017, p. 3). The ODL system has learners with different languages who need learning support in their own languages. There is therefore a need to examine the status of e-resources in local languages so that learners can be better supported.

This study is an analytical review of e-resources in local languages based on policy documents, and its implementation by educational institutions for promoting such e-resources. The study reviews the nature and type of e-resources, tabulates them, and examines their accessibility through online platforms. The sample includes two open universities in India. Due to the lockdown situation caused by Covid-19, the study has been conducted using documents available online in the public domain.

The findings showed that the universities involved were implementing their educational programmes using more than one language. During the pandemic-related lockdown, e-resources in all languages are being promoted by universities. The spurt in online learning, webinars, teleconferencing and research work has resulted in a greater demand for e-resources. There has been higher usage by teachers and learners of government educational platforms, such as SWAYAM and educational channels such as SWAYAM PRABHA (<https://swayam.gov.in/2020>) which have translation facilities.

This study highlights the need for more e-resources in local languages. This implies that ODL institutions should allocate higher budgets and more resources for this task. The study will help to strengthen a common database for knowledge-sharing that will be beneficial for lifelong learning for all.

Prospects for Agricultural MOOCs in an ODL System: YCMOU's Experience

Madhuri Shrikant Sonawane

Yashwantrao Chavan Maharashtra Open University

MOOCs as an Effective Pedagogy for the Least Developed and Resource Constrained Countries: Experiences from Nepal

Parbat Dhungana

Kathmandu University

Prakash Dhami

Creative Academy

The Government of India initiated a programme “Study Webs of Active Learning for Young Aspiring Minds” (SWAYAM) in 2017, with the aim of achieving three important principles of education policy, viz. access, equity and quality. The major objective of this programme is to make teaching and learning resources available to everybody. Accordingly, several courses are hosted on this platform which consist of course content such as video lectures, text material, web reference links, PowerPoint presentations, tests and quizzes, along with an online discussion forum. These Massive Open Online Courses (MOOCs) can be accessed by anyone, anywhere and at any time, free of cost.

Yashwantrao Chavan Maharashtra Open University (YCMOU) has produced its first MOOC in agriculture and uploaded it on the SWAYAM platform. A study has been conducted to assess the learners' views on this online course in agriculture.

A MOOC entitled “Commercial Fruit Production: Pomegranate and Guava” was produced and offered twice in 2019. An online questionnaire was distributed to the enrolled learners to gain feedback about how they had become aware of the course, their usage of it, and their opinions on the quality of the content of the MOOC offered through an open and distance learning (ODL) mode. The responses obtained were converted into percentage data.

The initial response to the MOOC was overwhelming with an enrolment of 1,443 learners, though only 4% appeared for the examination. Eighty-two percent of the respondents had not studied a MOOC before and became aware of the course from sources such as the SWAYAM portal, the Internet, faculty and friends; and 76% of the learners accessed the course from home, mainly through mobiles and laptops.

The majority of the learners were satisfied with the content and quality of the course as well as the presenter's knowledge. Forty percent of the respondents reported the use of more scientific and difficult words in video lectures, whereas 14% were annoyed by the background music used in the video lectures.

Since 1990, YCMOU has offered various agricultural programmes through the ODL/blended mode and about 3,37,000 learners have completed these courses to date. Learners' responses to the emerging educational model of MOOCs will help to frame the policy in future for the implementation of online courses in the field of agriculture.

This paper shows the learning experiences with MOOCs of elementary students in Nepal. Teachers in Nepal have limited knowledge and skills, and are reluctant to experiment with innovative classroom approaches. This study was designed to see whether taking students through a MOOCs experience can add value to their learning outcomes. MOOCs was chosen essentially because scholars have established that it doesn't add a burden to the school/teachers; students can handle it on their own; and it contributes to becoming responsible netizens.

A case study school, Creative Academy, gave consent for a mini-scale study with Grade 7 students during April 2017. Following their learning, students were asked to complete selected MOOCs as a mandatory requirement for the completion of their grade levels (Grades 4 to 8) in the school. Very few students received extra support for enrolment in MOOCs, whereas all students were reminded every week to work on coursework – to which students responded by raising the issue of Internet connectivity!

With the same set of teachers, and the same curriculum and textbooks, a comparison of performance data with cohorts over the last three years showed significant progress on the learning outcome among students with MOOCs. In 20018–2019, learners found learning using MOOCs to be a very exciting experience, and said that the conventional mode was lacklustre compared with MOOCs which offered better learning of English language. “Flexibility” was the key word used by students to explain the features of MOOCs. It was interesting that students used their experience on these courses as vehicles to convince their parents who were sceptical about the use of online learning resources.

This progress in student's academic output is evidence that carefully selected MOOCs complement learning with no demanding investments. MOOCs can be offered with resources which are already available, an Internet connection and a mobile or computer. This study indicated the possible use of MOOCs for boosting the quality of education among the least developed countries, such as Nepal.

Fundamentals of Adjusting MOOCs in Acquiring Innovation Competencies

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Observable arrangements in adjusting quality-satisfied massive open online courses (QS-MOOCs) related to Indonesia 4.0 were particularized in this study. It was expected to visualize its determinants observed by faculty related to endorsing innovation competencies. It was also of interest to disclose how and in what routines all attributes involved interrelated with one another.

An exploratory design (mixed methods) was utilized. A conceptual framework was established first by conducting activities consisting of a series of literature reviews and focus group discussions. QS-MOOCs includes presage, pattern, process, product, practicability, prospective, and power (7P). QS-MOOCs was viewed from scientific, technical, economic, and socio-cultural perspectives. QS-MOOCs preceded innovation competencies (critical thinking, creativity, and networking). The operational framework was then established with the 7P, QS-MOOCs, and innovation competencies as independent, moderating, and dependent variables respectively. The population was the faculty of Universitas Terbuka Indonesia. Respondents were randomly chosen to accumulate data through a survey of 631 academic staff. Methodically, importance-performance analysis (IPA) and a customer-satisfaction index (CSI) were emulated and then utilized to synchronously estimate the satisfaction level of QS-MOOCs and their degree of importance. Ten hypotheses were developed and then examined by applying structural equation modelling (SEM). This was meant to scrutinize the loading factor and interrelation power among the factors involved. Replies from 142 respondents were finally completed.

Statistically, seven out of the ten hypotheses examined were validated by the analysis. It was decisively recognized that product was the most significant determinant of QS-MOOCs, followed by power, practicability, pattern, and prospective. QS-MOOCs had direct control over critical thinking and creativity, whereas presage, process, and networking were excluded by the analysis. The study was also able to encounter 24 (out of 32) attributes as the pillars of QS-MOOCs. The quantitative frame was statistically satisfactory as of the nine cut-off values, seven were in the good-fit and two in marginal-fit categories.

The qualitative framework seems defectively strengthened by the quantitative procedure. The study recognized that variance refers to the three invalidated hypotheses. A further in-depth review is required to find the motives and diminish

plausible divergence. This can be done by searching for a more relevant approach, augmenting conjectural coverage, and/or enlarging the sample size.

MOOCs of Inclusive Technology in Higher Education for Vocational and Professional Education and Training

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Vocational Training Council

A poll found that four in five Hongkongers view vocational education and training as inferior to university education, but a Think Tank has said that having a high proportion of university graduates does not match labour market needs. Employers in today's job market are looking for technically skilled, job-ready candidates which a traditional degree doesn't always guarantee.

Massive Open Online Courses (MOOCs) allow greater flexibility than traditional education to provide training in the most contemporary fields and reduce the skills gap. This project aims to provide courses in an open learning environment that have a promising future for prospective employees and are most useful for students moving into the modern workforce after school.

In this MOOCs development, a four-step approach was employed, with the ultimate goal being to promote lifelong learning and upskilling. Firstly, we aim to design the MOOC in such a way that it can help students to build up their practical skills for work. Secondly, we use technology-enabled means to achieve our goal. Thirdly, the MOOCs should be attractive, and take less time and effort to develop. Fourthly, our MOOC courses are free and students can access them anytime and anywhere. The opportunities are endless in this digital place – from learning new crafts to picking up a minute skill. On implementation that influences retention, this paper also reports on a survey of 129 participants enrolled on *Foundation Mathematics for Engineering* who were encouraged to take a MOOC of their own choice as part of their development. Sixty participants (47%) did not go on to complete an entire course. A post-MOOC focus group study of students' perceptions found that they perceived the effectiveness of the course content, and interaction with the teacher of the MOOC, to be significant factors in MOOC retention.

Like many others, we encountered two major challenges that influenced retention, viz. the high drop-off rate and the failure of learners to complete courses in which they were enrolled. These are the two common issues that all MOOCs around the world have to overcome. In light of the post-MOOC study, our project team tried our very best to redesign the MOOCs so that they were not redundant or repetitive to learn again with respect to the actual classes. When students learn, we hope that it helps them to actually do the work and our MOOCs are so different with a high proportion of trade-related contents. We provide them with customized teaching using a bite-sized base pattern which has been constructed to fit each student individually on the basis of a few pre-course measurements.

Selected trade-related modules in the area of in-service training for engineering have been developing since 2014 and MOOCs effectively strengthen students' practical experience and meet the human resource needs. Students are provided with career-related exposure through bite-size learning activities. Overall, the study explains the variance in MOOC retention and detailed actions that can be taken to improve the retention of MOOCs.

Adopting a Reflexive Disposition as a Teacher<+>Researcher to Reconceptualize a Science Teacher Education Course

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The purpose of this study is to examine the perspectives of undergraduate, pre-service science teachers and a teacher<+>researcher as the teacher<+>researcher grappled with the findings from his own research and how to acknowledge and ethically incorporate those findings into his course and pedagogy.

In this study, the author was both the teacher and the researcher (teacher<+>researcher) of a reconceptualized science teacher education course. Designating the author as “teacher<+>researcher” signifies a self-study reflexive methodology in which the roles of both teacher and researcher are synergistically merged, and where one role and the learning(s) from it inform the actions and thoughts of the other. The reconceptualization of the course over time was a consequence of: (a) the findings from research conducted by the author as researcher to understand the metacognition of practising and pre-service science teachers; and (b) the contemplations and reflections of the author as teacher over seven years as he attempted to revise his course and pedagogy to ethically influence undergraduate, pre-service science teachers to attend more to their own metacognition related to their learning and teaching. The data in this study are the pre-service science teachers’ voluntary, anonymous evaluations of the teaching of the teacher<+>researcher and his course content, and the reflections of the teacher<+>researcher as he changed his course and pedagogy.

Two major findings are reported. Firstly, drawing on students’ evaluations of the teaching of the teacher<+>researcher, it is asserted that students in the recent (since 2015) orientations of his course could identify differences in the content of the course and orientation of the pedagogy employed by him in this course, compared to students taking his course prior to 2015. They identified the teacher<+>researcher’s attention to metacognition and the pragmatic operationalization of learning theory as aspects of the course that had a positive impact on their learning. Secondly, drawing on the teacher<+>researcher’s reflections, it is proposed that a reflexive disposition is valuable in enabling a shift in one’s pedagogy in response to one’s research findings, with such a shift being an ethical imperative.

Reconceptualizing teacher education implies changing teacher education pedagogy, which is often difficult. This introductory study provides insights into how adopting a teacher<+>researcher role can effect innovative, ethical, research-informed change in pedagogy to benefit students. Therefore, it provides a template for others working in science teacher education and the development of teachers’ metacognition to consider.

English Pop Songs Facilitate Informal Language Learning with Learner Autonomy

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This study investigates the impact on informal L2 language learning of English pop songs and the related literacy practices, such as reading lyrics, making comments on English songs, and sharing comments with others.

This research uses both quantitative methods (online questionnaires) and qualitative methods (one-on-one interviews) to explore the impact of online English pop songs and related activities on second language acquisition outside the classroom (informal settings). Twelve students (eight females and four males) filled in the questionnaires and eight students (all females) were invited to one-on-one interview, which included four main questions. For the interview, a sociolinguistic approach was used and a “show and tell” technique was applied.

Digital literacy practices in the form of listening to pop songs were transferred into language learning literacy practices with the help of learner autonomy and affinity spaces. In addition, although initially some participants felt that the literacy practices were unrelated to language learning and were just for leisure purposes, they finally realized that these informal literacy practices they had engaged in had a positive influence on their language acquisition.

This study has implications for L2 language teaching and learning. Initially, digital literacy practices can have a positive effect on English digital literacy development. Digital technology, such as online activities related to pop songs, create affordances for taking language learning outside the classroom. Digital literacy practice activities can be personalized for distinct situations and different students. In addition, teachers can rethink the relationship between what happens outside and inside the classroom. This means that students are encouraged to learn English through their daily literacy practice – not only from school education – since literacy practices are social cultural practices, not only instructed process at school. English learning can be embedded into daily life. This suggests that in the future teachers could focus on incorporating pop songs or other informal digital literacy practices as part of classroom teaching and learning.

Research and Practice of College Teaching of English Listening from the Perspective of Multi-modal Discourse

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Shaohua Wang

Nanjing Normal University

With the increasing demand for foreign language talent in colleges and universities, the teaching of English listening there needs to be reformed urgently. In recent years, scholars have conducted a large number of research projects from the perspective of multi-modal discourse on language teaching and learning. Multi-modal discourse analysis emphasizes the comprehensive use of multiple modalities in order to improve the teaching efficiency. Based on the previous research, this paper analyses the basic problems in teaching English listening in colleges and universities. It is expected that we should attach great importance to the teaching of English listening in colleges, optimizing the English listening resources and reforming the English teaching mode. In this paper, an innovative mode of teaching English listening in colleges is constructed from the perspective of multi-modal discourse. It is hoped that this study will provide new ideas for the reform of the teaching of college English listening and promote its efficiency.

This involved thematic reviews on multi-modal discourse analyses and previous research on college English teaching (literature review method); building a new mode from the perspective of multi-modal discourse (case analysis method); and summarizing three specific implementation strategies for the new model (induction method).

Based on multi-modal discourse analysis, this paper studies the new model for the teaching of English listening in college which can organically combine teachers' multi-modal teaching, students' multi-modal learning, and multi-modal mutual evaluation of teachers and students, and fundamentally improve the efficiency of English teaching. Colleges and universities can implement the new model for enhancing teachers' multi-modal awareness, building a multi-modal teaching environment, and adopting a multi-modal preparation for teaching.

Multi-modal teaching of listening can not only expand listening resources, but also fully mobilize and stimulate learners' multiple senses to participate in listening, which is very helpful for cultivating college students' multiliteracies. Multi-modal teaching of English listening in colleges can have important pedagogical implications for developing students' multiliteracies by enlarging multi-modal listening resources and adding relevant course design.

Forming Digital Shepherds: Evaluating Participation in and Satisfaction with a Blended Learning Course on Communication Theology

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The Catholic Church expects priests and seminarians to be well informed, critical and creative users of information and communication technology (ICT) so that they can be effective leaders and efficient communicators. Currently, most of the theology institutes use conventional or traditional face-to-face teaching methods. The first-ever implementation of blended learning as an innovative teaching and learning modality was for a course on Communication Theology in Saint Peter's Pontifical Institute, Bangalore, using the lab-rotation model for one semester. It explored the students' participation in and satisfaction with the course using a blended learning modality.

In this study, the course was designed using an analysis, design, development, implementation and evaluation (ADDIE) model, and was developed and implemented using a modular object-oriented dynamic learning environment (MOODLE) learning management system (LMS) and evaluated for 21 first-year theology students. This quasi-experimental research analyzed the online questionnaires using a Likert's scale.

The first-year theology student-respondents actively participated and expressed their satisfaction in varied ways. They preferred group activities, Facebook group chats, YouTube videos, and online assignments. Also, they easily adapted to learning through MOODLE, and were highly satisfied with the course.

Although the Catholic Church recognizes that future ministers have to be better communicators, no formal research has been conducted on the integration of ICTs. The findings in this research have confirmed the possibility of adopting blended learning and preparing the seminarians for the future. This study has also shown that the future shepherds of the Church must be digital citizens who engage with ICT in their lives and mission. Implementation of blended learning for a Communication Theology course opens a new era of ICT integrated education in the seminaries.

How Teachers' Engagement Affects Intelligent Tutoring Systems Integration



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This paper identifies teachers' roles in the creation of the Intelligent Tutoring System (ITS) and its applications in classrooms in the past and present. This review is based on empirical studies of the ITS, learning theory frameworks of constructivism, and interaction theories. We also suggest the future outlook on the teachers' roles and how we can encourage them to engage in improving and amplifying the ITS in classroom settings.

We analyzed 58 articles from the *International Journal of Artificial Intelligence in Education* (IJAIED) and evaluated the teachers' activities in each article along the following dimensions: involvement in the ITS module, the stage, and the activity types. Involvement in the ITS module refers to the aspect that ITS teachers' activities were related to –for example, providing expertise to formulate the knowledge domain module, the instruction module, the student module, or the user interfaces. The involvement stage refers to whether the teachers participated in the ITS development, implementation, or evaluation stages. Activity types represent the teachers' role which was articulated in the articles, e.g. instructional designer, domain expert, main user, and developer. We synthesized the results of the analysis as (1) the teacher's roles in the ITS development stage; (2) the teacher as an active user of the ITS; and (3) the teacher as an ITS developer.

It was found that teachers played a key role in the ITS development stage by sharing their knowledge of the domain, giving instructional examples, and identifying students' learning needs. Also, by collaborating with the teachers, the researchers could create an effective ITS that had a significant influence on students' learning outcomes throughout a diverse knowledge domain. Teachers also played a leading role in integrating the ITS into regular teaching practices in classrooms. They could deliver the content with adequate instructional strategies and provide students with adaptive feedback by utilizing the ITS in their curriculum. Moreover, along with the development of ITS authoring systems for non-programmers, teachers have new opportunities to contribute to the effective learning of students with intelligent tutors.

Realizing the benefits of the ITS in school settings is dependent on the capability of teachers to promote students' learning experiences in K-12 classrooms. However, most of the ITS studies focused heavily on its effectiveness in students' learning outcomes regardless of grade-level or subject domains in their application. The results of this study highlight the importance of providing teachers with proper training and professional development and encouraging them to pursue meaningful integration of the ITS into their curriculum and instruction.

The Application and Effect of Smartphones and an Online Tutoring System for Vocabulary Drilling through Nine Semesters

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With the popularization of smartphones, it is valuable to investigate the way and effect of using smartphones together with intelligent tutoring systems in the regular instruction of higher education institutes – for example, in the teaching of English as a foreign language.

This paper reports on experiments using smartphones together with an intelligent tutoring system, CSIEC, in the teaching of English as a foreign language to undergraduate students in a technical university in China over nine semesters. During the first three semesters, controlled quasi-experiments were used and the last six semesters involved natural experiments. In total, 2,145 treatment students and 1,963 control students participated in this long-term research.

The findings included the positive effect of this blended-learning approach on students' learning performance because of the instant feedback of the tutoring system and full use of the multimedia function of the smartphones, as well as the easiness and usefulness of the voluntary participation and natural grouping with smartphones.

This research attempts to narrow the gap between the popularity of smartphones and the lack of corresponding long-term empirical research on integrating smartphones into regular institutional education. The instruction in the classroom can be more efficient and equal for all students if the multiple functions of smartphones can be strengthened with intelligent tutoring systems – even if the students are not required to use smartphones, but are asked to use them freely in the learning process.

Japanese University Students' E-Readiness: A Preliminary Study

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The primary aim of this study is to examine Japanese university students' e-readiness for the shift toward remote learning. The focus is placed on students' self-analysis of their abilities to use their smart devices for e-learning activities, including web research, time management, checking emails and messages from instructors, and using the e-learning features of their school's LMS. Students were also asked about their enthusiasm for online learning, and their thoughts and feelings about interacting with their classmates in this new way.

Japanese university students across five different elective English courses participated in a survey in preparation for their imminent remote learning classes. Their majors included literature, law, economics and engineering. The students did not have any online learning experiences in secondary school and their study experiences even in secondary and tertiary education were large lecture-type language classrooms using predominantly paper-based materials. A 13-item voluntary survey was created by the authors and was provided to students via the LMS. In addition to multiple choice and "yes-or-no" questions, students were encouraged to give some written responses. They were sorted out and analysed using cross tabulations.

The findings suggest that the majority of the students had no difficulties in using the university's learning management system and checking notifications and emails from teachers and faculty, but the need to have online lessons remains a significant concern for them. Many of them are hampered by their reliance on smartphones which present challenges for multitasking, reading, note-taking, and collaboration.

This study examined Japanese university students' e-readiness using scales on areas such as technical competence, lifestyle aptitude and learning preference for e-learning. It provided instructors with valuable insights into how to implement remote learning in language courses and what kinds of support may be indispensable for students, at least in Japanese educational settings. Teachers and institutions should experiment with more flexible teaching approaches by utilising various Internet resources and adopting new methods.

A Framework of Smart Pedagogy Based on the Facilitating of High-order Thinking Skills

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Thinking abilities, especially high-order thinking skills, are more and more important in the rapidly developing society. It is urgent to improve the thinking ability of students. The purpose of this research is to construct a general smart pedagogy model to facilitate the high-order thinking skills of students and provide design suggestion for the curriculum and intelligent tutoring system (ITS) in smart education. The effect of the smart pedagogy model should be verified by a quasi-experiment.

A smart pedagogy framework was designed, and the quasi-experiment was conducted in a junior high school. The experimental class utilized the smart pedagogy and smart learning environment, while the control class adopted conventional teaching strategies. The mathematics test scores of these two classes were compared to verify the effectiveness of smart pedagogy.

The smart pedagogy framework contains three sections: the SMART key elements model; the curriculum design method; and the detailed teaching strategy. The SMART key elements model integrates the situated learning, mastery learning, adaptive learning, reflective learning and thinking tools. All of the five learning methods proved to be effective in facilitating high-order thinking and can be conveniently realized in the smart learning environment. The key elements model is the criterion for the curriculum design in smart education. The curriculum design method of smart pedagogy combines the first five principles of instruction and the SMART key elements model to design the curriculum. The detailed teaching strategies of smart pedagogy contain various kinds of innovative learning methods, including MOOCs, SPOC, personal inquiry learning, collaborative learning, blended learning, a mind map and a concept map. The results of the quasi-experiment showed that the learning outcome was significantly promoted by utilizing the smart pedagogy.

This research investigated a general framework that can be utilized to cultivate high-order thinking skills in different subjects and grades. The framework of smart pedagogy was innovative and effective in practice.

Open and Distance Education: Media Pedagogy, Open Educational Resources and Universal Design for Learning



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Numerous pedagogical innovations are taking place with the advances in media and new information and communication technologies (NICT). With these developments, openness has attracted the convergence of distance education, and open and flexible learning; and it has focused on an open curriculum, open standards, open admission, open source software, open educational resources and open tutoring. Open and distance learning (ODL) can support formal, non-formal and informal education. For example, in the coronavirus (Covid-19) pandemic, learners, teachers and the educational processes have been massively affected, and so conventional teachers have been compelled to think about and recognize the potential of online teaching-learning or ODL. In the 21st century, distance education has emerged as online teaching and learning in terms of design and delivery. The collective knowledge of learners grows faster in online learning and it is imperative to understand deep learning, which is participatory, connected, collaborative and creative learning. It requires openness, trust, collaboration, engagement, transparency, open learning spaces, and inclusive pedagogy. Open education resources (OER) are sustainable and renewable, and can save precious time in delivering online learning.

This paper describes the new pedagogical landscape, including networked literacies, social literacies, evolving media literacies, and literacies of learning. It highlights openness, open pedagogy, new media pedagogical competences, contextualized OER and the Universal Design for Learning (UDL). This study uses a constructivist paradigm, and the research methodology is analytical and explanatory in nature, based on primary and secondary data.

This study showed that new media and NICT are facilitating learner's engagement in a number of ways, including providing real flexibility and collaborative work. The United Nation's Technology and Innovation report (2018) highlights the importance of new media pedagogies, which are considered for curriculum design, development and transaction. It is imperative to understand the pedagogy, theories, principles and design of learning with new media and NICT. New pedagogic models or approaches are useful for mapping media pedagogies, and the selection of media in the context of the topic, teaching functions and media performance. Pedagogical innovation and design development requires media pedagogical competences.

Good OER relies on appropriate pedagogy, and critical and reflective learning. OER can be more inclusive by adopting

the framework of the Universal Design for Learning (UDL), which is based on three principles – multiple means of representation; multiple means of action and expression; and multiple means of engagement. The literature for this study adds to the present literature.

The Flipped Classroom Complements Peer Instruction: Better Student Perception and Higher Chemistry Achievement

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This study aims to examine students' perceptions of the flipped classroom with a peer instruction teaching strategy (FCPI) and its effect on the achievement of Grade 7 junior high school students in Chemistry in the Philippines. It is hoped that the results can contribute to the search for the most suitable strategy for the teaching of Chemistry to the millennials.

A two-group quasi-experimental pretest-posttest research design was used to determine the effect of the flipped classroom on the chemistry achievement of the students. The students in the FCPI were introduced to the lesson using the science courseware developed by the Department of Science and Technology and the researcher-modified science videos as pre-class activities. The in-class activity was focused on answering conceptual questions through peer instruction. The traditional classroom with peer instruction (TCPI) is a variation of the traditional lecture method with the students made to answer formative assessments with their peers. The effectiveness of the treatment was supplemented by journal entries, and participation and perception surveys.

The two groups of students significantly increased their Chemistry achievement after the implementation of the strategies, with the increase in the FCPI being 4.99 % and 3.67 % in the TCPI. The students in the FCPI demonstrated better classroom participation than those in the TCPI. The design of the FCPI implemented in this study made students complete their assigned tasks on time, show a cooperative and supportive attitude during classroom discussion and activities, share ideas in class, and show respect for the opinion of others. The design of the FCPI was perceived by these students to be better than that of the TCPI.

Improving the students' performance before class – that is, in a flipped classroom – is likely to increase their achievement in an active learning activity like peer instruction and give them a better perception of the teaching strategy. Although an active learning activity was present in the TCPI, the class time was not maximized as it was too focused on delivering the content. In the FCPI, the pre-class activity was instrumental in improving the performance and perception of the students during the peer instruction activity. The pre-class activity alone may not give the desired learning outcome unless it is connected to a specific lesson in class or applied in an active learning activity such as the peer instruction activity. This supports the complementary or “synergistic” effect of combining the flipped classroom and peer instruction strategies.

Use of Free and Open Source Software (FOSS): International Development and its Implications for Higher Education in Hong Kong

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Free and open source software (FOSS) has been used worldwide because of the advantages of more control, easier training, more security and better stability. The purpose of this study is to explore the status quo and trends from international perspectives and its implications for higher education in Hong Kong.

The method of cluster analysis was employed in this study. The Web of Science (WOS) database was used as the data source and all relevant literature for the last 11 years (2010–2020) on the theme of “free and open source software” will be collected for analysis. The information visualization software CiteSpace was used for citation visualization analysis, revealing the research results of free and open source software worldwide, including hot spots and development trends.

This paper found that FOSS has become an important research area and is playing a significant role in the reform and development of education. Meanwhile, the development and application of FOSS have regional imbalances and strong differentiation, including in the educational sector. It was also found that, although FOSS has entered the stage of interdisciplinary development, the research and development of FOSS in the field of education is insufficient, which poses a huge challenge to decision-makers, teachers and students.

The implications of this study for higher education in Hong Kong include the following points: (1) Attach importance to and vigorously promote FOSS research and practice to benefit more teachers and students; (2) Teachers and students need to be trained for acquiring the awareness of and skills for FOSS applications and formulate different strategies; (3) The government should provide greater support to formulate and implement a short- and middle-term development plan to facilitate the application of FOSS; and (4) Hong Kong higher education institutions may strengthen exchanges and cooperation with counterparts around the world to jointly promote the development of FOSS. It is hoped that the findings of this study will provide a reference for the study and application of free and open source software in higher education in Hong Kong.

Social Media — a Supplement and Complement to Learning Management Systems in Online Distance Learning

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This paper explores the students' use of a social media LINE and the online discussion forum in the formal learning management system (LMS) as tools for their team interaction and communication when doing a team project in online courses. It focuses specifically on modes of interaction in both platforms and students' preferences for the two educational technologies.

The subjects for this study were the students who enrolled in two online distance courses offered by the Department of Foreign Languages and Literature in an open university in 2017 and 2019 separately. The students in both courses were assigned team projects to complete as a part of the requirements of the courses. In the 2017 course, the participants had to adopt a team discussion forum in the LMS as the tool for team interaction and communication, with LINE as an additional option. In the 2019 course, the students were free to choose the communication tool(s) they preferred – either LINE, or the team discussion forum in the LMS, or both. LINE is a communication app available in smartphones and computers with functionality for exchanging texts, images, video and audio, and conducting free Voice over Internet Protocol (VoIP) conversations and video conferences. I used data drawn from student postings in LINE and the LMS team discussion forum in the 2017 course and a questionnaire survey in the 2019 course, to offer insights into the modes of interaction in LINE and the LMS team discussion forums and the reasons for students' choosing a certain communication tool.

Students preferred LINE over the LMS for team interaction and communication because of convenience, privacy, functionality, immediacy and the popularity LINE possesses. Differences in the modes of interaction appeared from the postings data. The students' interaction in the LMS and LINE were both learning-oriented with collaboration, teamwork-related interaction and knowledge construction for task completion. In addition, LINE was also socializing-oriented with festival greetings, after-project interaction and project-irrelevant postings.

Social media platforms offer features and functions that can be leveraged to supplement and complement the use of a traditional LMS. However, a comprehensive strategy is needed to successfully leverage social media into online learning, in terms of the absence of an instructor in student discussion in the social networking platform. An integration model which merges social media platforms into LMS

is recommended to include the presence of a teacher in students' team discussion without interfering with student privacy.

A Case Study on Using Technology-assisted Active Learning Components for Science Foundation Subjects

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As the scope of practice for undergraduates expands to include developing all-round learning and high intellectual capacity, undergraduate courses are increasingly incorporating a variety of general education (GE) subjects from history and culture to science and technology into the curriculum. However, the large variation in students' learning progress causes the teaching of these GE subjects to become challenging due to their broad academic backgrounds. The purpose of this paper is to examine the possibility of implementing technology-assisted learning (TAL) tools in a traditional classroom to enhance students' engagement and motivation in learning science.

We incorporated various TAL tools in a face-to-face traditional classroom for a subject with students who had a broad academic background. We presented a case study for the foundation year subject *Greenhouse Gases and Life* (ABCT1D09) launched in PolyU in Semester 1 of 2019–2020. We investigated the implementation of TAL pedagogies (technology-assisted laboratory classes and a remote lab) and other active learning pedagogies in the traditional face-to-face (F2F) lectures with the use of a virtual learning environment (Blackboard) to improve students' learning experience by enhancing their engagement in this large GE class (90 students). The effectiveness of this model was evaluated by a survey and students' academic performance.

Over 90% of students' usage of Blackboard was as a medium for accessing course materials and the delivery of notifications, and course reminders and arrangements. Most students (91%) gave positive responses towards this reformatted traditional lecture. Also, 75% of them (27 out of 36 replies) found the course to be an enjoyable learning experience, and the integration of the laboratory class into the traditional lectures was viewed as the best learning activity in this course.

The results obtained reflected that the TAL model in the present study may offer more new learning opportunities in tertiary all-round education.

Development of STEAM Robotic Courses to Enhance Students' Tendency to Develop 21st Century Skills

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Recently, many educators have started to intergate robot education into STEAM activities that lead students to build robots and solve tasks through the robots. However, few research studies have focused on developing STEAM courses that fulfil the goal of cultivating students 21st century skills (e.g. collaboration, critical thinking, creativity, problem-solving, and communication). In addition, few studies have investigated the effectiveness of the activities in developing such skills in students. Therefore, in this study, a STEAM robotic activity was developed that aimed to encourage students to apply cross-disciplinary knowledge and cultivate these skills. To investigate the effectiveness of the activity for developing 21st century skills in students, the students' tendency to develop creativity, critical thinking, problem-solving, collaboration, and communication before and after the courses was collected.

The study involved a three-month activity, in which 541 Taiwan K4 to K9 students were enrolled in the courses. During the activity, students not only needed to learn the knowledge and skills for developing and programing the robots, but also had to frequently conduct discussion and experimental inquiry with their team members. Also, they were invited to respond to a questionnaire on their tendency to develop 21st century skills before and after the activity.

The responses of the students to the questionnaire were analysed in order to explore whether their tendencies had changed through the activity. According to the pair-sample t-test, the tendency of the students for creativity, problem-solving, and communication was significantly better than before entering the courses ($t = -2.09 \sim -3.769, p < .05 \sim .01$). However, the students' tendency for collaboration and critical thinking did not show a significant difference when compared with the situation before the course ($t = -0.89 \sim -1.92, p > .05$).

In sum, the STEAM robot activity proposed in this course significantly improved student tendency to develop creativity, problem-solving, and communication. It revealed that a learning activity that encourages students to have frequent discussion successfully increased their tendency for creativity and communication. This activity, which allowed students to conduct experimental inquiry, was successful in encouraging them to solve problems by themselves. However, their tendency for collaboration and critical thinking did not change. Therefore, some suggestions are provided for future studies, such as increasing the opportunities for peer competition or peer judgements during the activity to stimulate student awareness of collaboration and justification.

Effects of the Interaction Degree of Environment Based on Virtual Reality on Oral English Learners' Cognitive Load and Learning Achievement



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Technology-supported language learning has gradually become a hot issue in EFL (English as a Foreign Language) research. However, traditional language-supported language learning merely provides learners with two-dimensional learning materials such as text and videos, and lacks the social learning context and social existence required for language learning. This study uses virtual reality technology to support the construction of virtual scenes to provide English learners with appropriate social situations and role interactions to help them learn more effectively.

This research involved the design and development of an English learning system based on virtual reality technology, and the learners were put in English learning scenarios with different degrees of interaction, provided by the system to carry out experiments. During the learning process, the feedback from the learners' cognitive load questionnaire was recorded; and after the experiment, the learners' learning achievement in different environments was examined. Two English-language teachers scored the learning achievement of learners to explore the effect of virtual scenes with different degrees of interaction on their cognitive load and learning achievement.

The results of the experiment revealed that the degree of interaction in the virtual environment had a significant impact on the cognitive load of the learners. The learners in the strong interaction scenario used more mental effort than those in the weak interaction scenario, and thought that the learning task was less difficult. Moreover, it was found that the learning achievement was higher when the learner thought that the task of acquisition was less difficult.

Value – Building a strong interaction virtual scene that can simulate the real world can help to increase learners' immersion and presence, and thus improve their performance. In short, this experiment involved a pilot study to improve learners' language learning ability and optimize virtual environment scenarios.

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