IEEE International Conference on Teaching, Assessment, and Learning for Engineering (TALE) 2017

Organizers
Message from General Co-Chairs

Dear all TALE 2017 participants,

Welcome to Hong Kong and IEEE International Conference on Teaching, Assessment, and Learning for Engineering (TALE) 2017!

In today’s rapidly changing education landscape, we have an increased responsibility to transform the educational experience from the traditional pedantic curriculum in explicit disciplines to a broader multi-disciplinary experience for life-long success. Undoubtedly, engineering requires its practitioners to continue learning new things and this has never been more vital than today. TALE 2017 provides an interactive platform for many participants around Asia and the globe to share their fruitful experiences in teaching, assessment, and learning for engineering. We are also very honor to have three renowned engineers/educators to deliver their keynote presentation at TALE 2017, Professor Edmundo Tovar, Professor Ting-Chuen Pong, and Professor Leslie Martinich. Their presences at our conference signify the professionalism and rigorous academic exchange opportunity in our conference.

Engineering education has demonstrated its key role to the society. Recently, there has been a trend to bring engineering education to K-12 education through integrated STEM education, which standards for “science, technology, engineering, mathematics”. Engineers have always been solving real-world problems with engineering design process, which embraces the knowledge and skills of science, technology and mathematics in the process of solving engineering problems. The solution brings modern technology to our world and enhance our quality of living. Engineering also brings forth new aspects, knowledge, and practices whereby transform the orientation of other disciplines and perspectives in handling new challenges in a transdisciplinary approach. To realize the potential of the future in the field of engineering, we demand for brighter and highly motivated students as well as advanced pedagogical and content designs in K-12 engineering education, and it also calls for the engineering educators to conduct more rigorous research to identify the good practices with strong theoretical orientations. Therefore, your presence at our TALE 2017 conference and continuous supports is the first step to transform the engineering education in the world! We look forward to this exciting conference with your excellent presentation.
We would like to thank all of the members of the organizing committee and the steering committee for their collective efforts and important contributions to the great success of this year. We would also like to express our warmest welcome to all of you attending this 2017 IEEE TALE at the Education University of Hong Kong.

Once again, thank you for your support and we hope that you enjoy your stay in the most beautiful city in the world.

Dr. WONG, Ka Wai Gary, PhD, SMIEEE
IEEE TALE 2017 General Co-Chair
Chair, IEEE Hong Kong Section (Education Chapter)
The University of Hong Kong

Dr. SO, Chi Fuk Henry, PhD
IEEE TALE 2017 General Co-Chair
The Education University of Hong Kong
Message from Technical Program Co-Chairs

Welcome to the IEEE International Conference on Teaching, Assessment, and Learning for Engineering 2017 (TALE 2017)! We hope that you will enjoy the various technical sessions, including traditional paper presentations, workshops, keynotes by renowned educational experts and authorities, as well as the social activities.

TALE is intended to complement the three flagship conferences sponsored by the IEEE Education Society, notably Frontiers in Education in North America (IEEE Regions 1–7), EDUCON in Europe/Middle East/Africa (IEEE Region 8) and EDUNINE in Latin America (IEEE Region 9). The conference theme for TALE 2017 is “Innovative Engineering Education for Smarter World”. The conference provides a venue for practitioners and researchers in various fields and disciplines to share their work and knowledge in engineering education, and includes both research and practice-oriented papers that encompass all aspects of education in the engineering fields (including computing, computer science, information technology and cognate disciplines).

TALE 2017 received a total number of 184 submissions, of which 30 full papers and 48 short papers were selected for presentation. Sessions topics ranged from learning analytics to quality assurance in engineering education. We have also arranged a panel discussion and keynote speeches on contemporary engineering education advancement. All qualified and presented papers will be published in the conference proceedings and uploaded to the IEEE Xplore database.

We would also like to take this opportunity to thank our authors for contributing their scholarship and innovations. We are also grateful to our reviewers for volunteering their time and effort in recommendations and referrals of quality papers. We also thank our session chairs who will play a critical role to guarantee the smooth flow of the presentations and discussions.

Lastly, we hope TALE 2017 will be a very successful conference with all of your participation and support.
Dr. Henry Chan  
IEEE TALE 2012 Technical Program Co-Chair  
The Hong Kong Polytechnic University

Dr. Gaowei Chen  
IEEE TALE 2012 Technical Program Co-Chair  
University of Hong Kong

Dr. Leon Lei  
IEEE TALE 2012 Technical Program Co-Chair  
University of Hong Kong

Dr. Tim Woo  
IEEE TALE 2012 Technical Program Co-Chair  
The Hong Kong University of Science and Technology

Dr. Haoran Xie  
IEEE TALE 2012 Technical Program Co-Chair  
The Education University of Hong Kong
Message from The Dean of EdUHK

It is with great pleasure for me to invite you to participate in the IEEE International Conference on Teaching, Assessment, and Learning for Engineering (TALE) 2017 to be held at The Education University of Hong Kong from 12 to 14 December 2017.

The theme of the conference is “Innovative Engineering Education for Smarter World”. With emerging systemic educational challenges in a modern world, the region has been undergoing education reforms, supported by theoretical, practical and methodological techniques, together with creative and innovative approaches, for improving sustainable development in education so that we can stay competent under keen competition in the international arena.

To this end, the IEEE TALE 2017 aims to give education practitioners, engineers, researchers and policy makers throughout the globe an invaluable platform for interesting and inspiring discussions and exchange of research-based knowledge, in order to stay vibrant and work strategically for the promotion of innovation, reform and education change in the new era.

You are sincerely invited to take part in this prestigious international event, and to share your innovations, experiences, leading-edge findings, best practices and visions of education reforms. Hong Kong, as a visually noticeable city, is a perfect location for hosting this educational conference. You are certain to enjoy your stay in this international city with its diverse culture and history. Looking forward to meeting you at the IEEE TALE 2017.

Professor Chung Wai Yee, Joanne
Chair Professor, Department of Health and Physical Education
Dean of Faculty of Liberal Arts and Social Sciences
The Education University of Hong Kong
Honorary Advisors
Susan Lord, University of San Diego

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The Education University of Hong Kong
Gary Ka Wai Wong,
The University of Hong Kong

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The Hong Kong Polytechnic University
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University of Hong Kong
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University of Hong Kong
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BNU - HKBU United International College

Local Arrangement Co-Chairs
Winnie Wai Man Lam,
The Education University of Hong Kong
Jeff Kai Tai Tang,
Caritas Institute of Higher Education
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<td>08:30-17:30</td>
<td>Registration</td>
<td>Outside D1-LP-04</td>
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<tr>
<td>09:00-12:00</td>
<td>W1A: Preparing to Publish in the IEEE Transactions on Education</td>
<td>Lady Ivy Wu Lecture Theatre (D1-LP-04)</td>
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<td>W1B: How to design and implement an Internet of Things node in 90 minutes (or less)</td>
<td>Computer Lab (D3-LP-11)</td>
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<td>12:00-13:15</td>
<td>Lunch</td>
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<td>13:15-16:15</td>
<td>W2A: Open Education Resources for Online Teaching and Learning</td>
<td>Lady Ivy Wu Lecture Theatre (D1-LP-04)</td>
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<tr>
<td>16:30-17:30</td>
<td>Keynote Speech (1)</td>
<td>Lady Ivy Wu Lecture Theatre (D1-LP-04)</td>
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<tr>
<td>17:45-19:45</td>
<td>Welcome Reception</td>
<td>Multipurpose Room (C-LP-02)</td>
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### 13 December 2017 (Wednesday)

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<td>09:00-09:30</td>
<td>Welcome Session</td>
<td>Lady Ivy Wu Lecture Theatre (D1-LP-04)</td>
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<tr>
<td>09:30-10:30</td>
<td>Keynote Speech (2)</td>
<td>Lady Ivy Wu Lecture Theatre (D1-LP-04)</td>
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<td>10:30-10:50</td>
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<tr>
<td>10:50-12:20</td>
<td>S1A: Computing Education (I)</td>
<td>Dr &amp; Mrs Allen Shi Lop Tak Lecture Theatre (D1-LP-03)</td>
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<td></td>
<td>S1B: IT Curriculum (Panel Discussion)</td>
<td>Lady Ivy Wu Lecture Theatre (D1-LP-04)</td>
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<td>S1C: STEM Education</td>
<td>Lecture Theatre (D1-LP-08)</td>
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<td>12:20-13:30</td>
<td>Lunch</td>
<td>Outside D1-LP-03</td>
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<tr>
<td>13:30-15:00</td>
<td>S2A: Assessment and Feedback</td>
<td>Dr &amp; Mrs Allen Shi Lop Tak Lecture Theatre (D1-LP-03)</td>
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<td></td>
<td>S2B: Computing Education (II)</td>
<td>Lady Ivy Wu Lecture Theatre (D1-LP-04)</td>
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<td>S2C: Instructional Design and Learning</td>
<td>Lecture Theatre (D1-LP-08)</td>
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<td>15:00-15:20</td>
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<td>Outside D1-LP-03</td>
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<tr>
<td>15:20-17:20</td>
<td>Poster Session</td>
<td>Outside D1-LP-04</td>
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<td>Banquet</td>
<td>Courtyard Marriott (Sha Tin)</td>
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<td>1 On Ping Street, Sha Tin, New Territories, Hong Kong (Near MTR Shek Mun Station)</td>
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## Program at a Glance

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<th>Time</th>
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<td>09:30-10:30</td>
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<td>Lady Ivy Wu Lecture Theatre (D1-LP-04)</td>
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<tr>
<td>10:50-12:20</td>
<td>S3A: E-Learning</td>
<td>Dr &amp; Mrs Allen Shi Lop Tak Lecture Theatre (D1-LP-03)</td>
<td>Lecture Theatre (D1-LP-08)</td>
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<td>S3B: Interdisciplinary Learning</td>
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<td>Christina Ting Yuk Chee Lecture Theatre (D1-LP-07)</td>
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<td>S3C: Online Learning</td>
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<td>12:20-13:30</td>
<td>Lunch</td>
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<td>13:30-14:50</td>
<td>S4A: Engineering Education</td>
<td>Dr &amp; Mrs Allen Shi Lop Tak Lecture Theatre (D1-LP-03)</td>
<td>Lady Ivy Wu Lecture Theatre (D1-LP-04)</td>
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<td>S4B: Learning Analytics</td>
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<td>Christina Ting Yuk Chee Lecture Theatre (D1-LP-07)</td>
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<td>S4C: Quality Assurance</td>
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<td>15:00-16:20</td>
<td>S5A: Generic Skills</td>
<td>Dr &amp; Mrs Allen Shi Lop Tak Lecture Theatre (D1-LP-03)</td>
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<td>S5B: Featured Discussions in Engineering Education (Best Paper Candidate Session)</td>
<td>Lady Ivy Wu Lecture Theatre (D1-LP-04)</td>
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<td>S5C: Learning Technologies</td>
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<td>Christina Ting Yuk Chee Lecture Theatre (D1-LP-07)</td>
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<tr>
<td>16:20-16:40</td>
<td>Afternoon Tea</td>
<td>Outside D1-LP-03</td>
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<td>16:40-18:00</td>
<td>S6A: Co-Learning and Motivation</td>
<td>Dr &amp; Mrs Allen Shi Lop Tak Lecture Theatre (D1-LP-03)</td>
<td>Lady Ivy Wu Lecture Theatre (D1-LP-04)</td>
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<td>S6B: Educational Games</td>
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<td>Christina Ting Yuk Chee Lecture Theatre (D1-LP-07)</td>
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<td>S6C: Teaching Circuits and Systems</td>
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<tr>
<td>18:05-18:25</td>
<td>Closing Session</td>
<td>Lady Ivy Wu Lecture Theatre (D1-LP-04)</td>
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Free Wi-Fi

SSID: Wi-Fi.HK via EdUHK
(No password required)

Free Shuttle Bus Schedule

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<th>MTR University Station (Exit B) → EdUHK</th>
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<th>EdUHK → MTR University Station</th>
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<tr>
<th>EdUHK → Courtyard Marriott (Sha Tin) (Banquet Dinner)</th>
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<td>13 Dec</td>
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IEEE TALE 2017 Floor Plan

Block B4 to D3
Lower Podium Level
The Education University of Hong Kong
Tai Po Campus
香港教育大學大埔校園

Free Shuttle Bus pickup/drop-off
Ground floor, D1

Conference Area
LP floor
Tuesday: Dr. Ting-Chuen Pong

Hong Kong University of Science & Technology (HKUST)

Cornerstone Engineering Design Education using a Blended Experiential Learning Approach

The US National Academy of Engineering has called for a reengineering of the engineering education system in its report “Educating the Engineer of 2020”. It is recommended that the engineering process of designing, evaluating, building and testing should be introduced from the earliest stages of the curriculum, including the first year. Students should be engaged in team projects that connect engineering design with real-world problems. In this talk, I will present a cornerstone engineering design project course designed specifically for first year engineering students. This course aims at providing engineering students exposure to knowledge and skills from different engineering disciplines. Students will be divided into project teams and apply the acquired knowledge and skills to design and build engineering artifacts through experiential learning. In order to offer the course at scale, the technical components will be delivered using a blended learning mode and students would be engaged in experiential learning through working together in teams with senior engineering students. I will also discuss how learning analytics on data collected from the learning management system can be used to provide just-in-time feedback to the instructors and students.
The Speaker

Dr. Professor Ting-Chuen Pong is a Senior Advisor to the Executive Vice-President & Provost, Director of the Center for Engineering Education Innovation and Professor of Computer Science & Engineering at the Hong Kong University of Science & Technology (HKUST). He is a founding faculty member of HKUST, where he had served as the Associate Vice-President for Academic Affairs and Associate Dean of Engineering. He was an Academic Research Adviser for the Hong Kong University Grants Committee (UGC) from 2010 to 2012. He is currently a member of the Quality Assurance Council of the UGC and the Hong Kong Council for Accreditation of Academic and Vocational Qualifications.

Before joining HKUST, he was an Associate Professor of Computer Science at the University of Minnesota. He received his PhD in Computer Science from Virginia Polytechnic Institute and State University in 1984. Professor Pong's research interests include computer vision, multimedia computing and IT in Education. He is a recipient of the Pattern Recognition Society Award in 1990 and the HKUST Excellence in Teaching Innovation Award in 2001. In 2014, he led the HKUST team in the Wharton-QS Stars Awards Competition and was selected Winner of the Natural Sciences Award and Runner-up of the Hybrid Learning Award.
Wednesday: Dr. Leslie Martinich

Founder and President, Competitive Focus, Austin, TX, USA

Engineering Education and the Importance of Critical Thinking

Technology has brought us so much: trips to the moon, gene splicing, and autonomous vehicles. But it has also allowed us to neglect building our critical thinking skills. How and why has this happened? And what can we, as engineering educators, do to turn this trend around? In this inspiring talk, Leslie Martinich will describe ten ways we can inspire and teach young engineers to better solve problems and think critically.
The Speaker

Dr. Leslie Martinich is the Founder and President of Competitive Focus, an Austin-based training group providing executive training to technology leaders around the world. She is passionate about helping leaders become more effective and their companies to better compete.

She has worked in technology companies for more than 30 years, and was one of the architects of RPC, Remote Procedure Call technology, allowing for what is today cloud-based computing. She publishes regularly in the IEEE Engineering Management Review and was the 2012 IEEE-USA Congressional Fellow for Science and Technology Policy.

She has been active on several boards and is currently the Chair of IEEE’s Central Texas Section, encompassing Austin and San Antonio. She is also on the Board of Directors of Austin Shakespeare and is a volunteer for Hospice Austin. She has a Master’s Degree in Computer Sciences from the University of Texas at Austin.
Thursday: Dr. Edmundo Tovar

UPM, Madrid, Spain

A Look at Engineering Education from an Open Perspective

Educational movements, which raise great challenges and expectations and involve a huge community of different stakeholders, such as Open Education, require milestones in which to review the achievements and needs that remain unfilled, as well as the agreement of generic recommendations or guidelines that suggest a map of actions to be developed.

The second World Open Educational Resources (OER) Congress held last October can be considered in this sense. Groups interested as educators, teacher trainers, librarians, learners, parents, educational policy makers at both the governmental and institutional level, teacher and other professional associations, student associations, teacher and student unions as well as other members of civil society, and intergovernmental organizations and funding bodies contributed in to the document “Ljubljana OER Action Plan 2017”. This report contains recommended actions to mainstream open-licensed educational resources to build Knowledge Societies and achieve the 2030 Sustainable Development Goal to “Ensure inclusive and quality education for all and promote lifelong learning”. The recommendations are organized in five strategic areas, namely: building the capacity of users to find, re-use, create and share OER; language and cultural issues; ensuring inclusive and equitable access to quality OER; developing sustainability models; and developing supportive policy environments.
This talk will use as reference such strategic recommendations as a reflection showing different experiences around these areas, in particular in Engineering disciplines as well as some of the efforts aligned to theses ones of the IEEE Education Society.

The Speaker

Dr. Edmundo Tovar, received the computer engineering degree and Ph.D. degree in informatics from the Madrid Technical University (Universidad Politécnica de Madrid, UPM), Madrid, Spain, in 1986 and 1994, respectively. He is currently with the UPM as a Professor of information technology in enterprise. He has served as an elected member of the Board of Directors of the OpenCourseWare Consortium (2009–2013), Executive Director of the OCW Office of the UPM (2008–2012), and Executive Director of the Open Education Office at UPM (2013-2016). Prof. Tovar is a Certified Software Development Professional (CSDP) (2005-), Professional Software Engineering Master Certification (2015-) of the IEEE Computer Society.

Member of the IEEE Education Society Board of Governors (2005–2012) he is currently Vice President of Educational Activities and Awards (2013–
W: Workshop
12 December 2017 (Tuesday)

09:00-12:00  W1A: Preparing to Publish in the IEEE Transactions on Education
Location: Lady Ivy Wu Lecture Theatre (D1-LP-04)

W1B: How to design and implement an Internet of Things node in 90 minutes (or less)
Location: Computer Lab (D3-LP-11)

13:15-16:15  W2A: Open Education Resources for Online Teaching and Learning
Location: Lady Ivy Wu Lecture Theatre (D1-LP-04)
**W1A: Preparing to Publish in the IEEE Transactions on Education**

**Jeffrey E. Froyd**  
Texas A&M University, United States of America

Workshop Learning Outcomes

- Selecting an appropriate area of scholarship
- Addressing review criteria

First Half of the Workshop

Scholarship in engineering education is shifting and authors seeking to publish their work in engineering education must be prepared to address increasing expectations for scholarship. The first half of the workshop introduces expectations for scholarship in a developing field. Next, areas of scholarship are examples and three of the areas of scholarship proposed by Ernest Boyer are examined:

- Scholarship of Discovery
- Scholarship of Application
- Scholarship of Integration.

Finally, the first half of the workshop presents an overview of the review criteria for each area of scholarship.

Second Half of the Workshop

Participants in the second half of the workshop will explore how to address review criteria for each area of scholarship, e.g., relevance, intended outcomes, application/instructional design, and findings. Analysis of manuscripts submitted to the IEEE Transactions on Education over the past five years suggest that authors struggle with how to address these review criteria. The intent of the second half of the workshop is to help authors and potential authors prepare manuscripts that address the expectations for publishing scholarship in engineering education in the IEEE Transactions on Education.
W1B: How to design and implement an Internet of Things node in 90 minutes (or less)

Patrick Kane
Cypress, United States of America

CONTEXT
By 2020 there will be 50 Billion devices connected to the internet (MIT, 2017). More and more institutions are implementing IoT courses as part of their curriculum (Class Central, 2017; MIT, 2017; UC San Diego, 2017). The proposed workshop will introduce attendees to available development kits suitable for education and will include a hands-on lab to create and program a BLE enabled development kit thus creating a simple IoT node.

PURPOSE OR GOAL
Provide an overview of low cost IoT (BLE, ZigBee, and Wi-Fi) enabled development kits from multiple vendors, culminating in a hands-on workshop in which attendees create their own IoT node. An overview of typical IoT syllabi will also be presented.

APPROACH
In addition to the above, this instructor-led workshop will include a high-level overview of the Bluetooth Low Energy (BLE) stack, and walk the attendees through the creation of a BLE application that can communicate with Apple or Android smart phones.

ACTUAL OR ANTICIPATED OUTCOMES
Each attendee will receive a BLE enabled development kit and software IDE and will leave the workshop with a working BLE application.

CONCLUSIONS/RECOMMENDATIONS/SUMMARY
It is anticipated that the workshop will inform attendees of the choices they have in choosing a technology to introduce a fundamentals of IoT course at their institution.

OTHER
Attendees should bring their Windows (or MAC with VMware etc.) laptops to the workshop.
W2A: Open Education Resources for Online Teaching and Learning

Sorel Reisman
California State University Office of the Chancellor, United States of America

In an era of Open Educational Resources (OER), open source software (OSS), and open access (OA) publications, MERLOT, the Multimedia Educational Resource for Learning and Online Teaching, stands out as the longstanding, favored digital repository for instructors seeking all manner of open resources for their teaching and research. The MERLOT community, which celebrates its 20th anniversary this year, consists of almost 150,000 registered members who have built a collection of almost 80,000 freely available learning materials. With more than 1,250,000 website visitors annually, MERLOT is the preferred international, interdisciplinary, multilingual resource for online teaching and learning materials.

This workshop will describe new features in MERLOT that broaden its utility for its users. It will demonstrate the system’s multilingual capability, focusing on the newly added discipline portals of Information Technology and Computer Science, recently endorsed by the IEEE Computer Society and the IEEE Education Society.

In the workshop, audiences can know more about:

- Overview of OERs and discuss the concept of openness, use and reuse of learning objects.
- How MERLOT and OERs can be used to enhance online teaching and learning.
- Overview of MERLOT- highlighting its functionality, navigation interface and uses. MERLOT Content Builder, a web site development tool, will be demonstrated.

At the completion of the workshop, participants will have a better understanding of OER platform, the concept of “openness” and OER, an ability to locate OERs and communicate with others in the MERLOT community to share and facilitate online learning and teaching strategies.
S: Paper Session
13 December 2017 (Wednesday)

10:50-12:20  S1A: Computing Education (I)
Location: Dr & Mrs Allen Shi Lop Tak Lecture Theatre (D1-LP-03)

S1B: IT Curriculum (Panel Discussion)
Location: Lady Ivy Wu Lecture Theatre (D1-LP-04)

S1C: STEM Education
Location: Lecture Theatre (D1-LP-08)

13:30-15:00  S2A: Assessment and Feedback
Location: Dr & Mrs Allen Shi Lop Tak Lecture Theatre (D1-LP-03)

S2B: Computing Education (II)
Location: Lady Ivy Wu Lecture Theatre (D1-LP-04)

S2C: Instructional Design and Learning Design
Location: Lecture Theatre (D1-LP-08)
An Intelligent Mining Technique for CBL

Rajeev Chatterjee¹, Sadhu Prasad Kar², Jyotsna Kumar Mandal³

¹NITTTR, Block-FC, Sector-III, Salt Lake City, Kolkata, India.; ²Tata Consultancy Services, Block-EP&GP, Sector-V, Salt Lake City, Kolkata, India.; ³University of Kalyani, Kalyani, Nadia, West Bengal, India.

Confidence Based Learning (CBL) is a state-of-the-art methodology for Technology Enabled Learning (TEL), where the system assesses the attainment of knowledge and confidence level of a learner in that domain. The implementation of CBL is done based on two-dimensional assessment system, where the assessment is done using Multiple Choice Questions (MCQs). However, it is being observed that qualitative and quantitative assessment of knowledge and confidence level at other places beyond learning environment is rare. This is one of the limitation of the existing model. Intelligent mining techniques may be adopted in this scenario. Learning Record Store (LRS) may be a potential tool to resolve this existing limitation. This is possible due to the reason that LRS record information about a learner during various phases / activities in which the learner is involved. The authors presented a design that will provide a holistic mechanism for Deficiency Diagnosis (DD) system.
Cyber Security Education for K-6 Using CS4K, Graphical Authentication and Authorisation Modules for Learning About Security

Geoff Skinner
The University of Newcastle, Australia

While Cyber Security is garnering a lot of recent publicity on the International Stage, it is important to note that little attention is being paid to security for the next generation of Information and Communication Technology (ICT) users. While many countries, including Australia, are making substantial investments in the future of Cyber Security, they are neglecting educating the children that are already heavy ICT consumers. The aim of this paper is to highlight the author’s current research work on the Cyber Security for Kid (CS4K) Framework, with specific focus on one of its key modules. Studies have shown that younger demographics have difficulties using and remembering text based passwords and traditional authorization schemes. As such, we propose a graphical role based access control (RBAC) scheme targeted for use by children. The concept is that children are better able to interact with and recall familiar graphical images rather than try to understand traditional RBAC schemes for granting permissions to access their ICT resources. Additionally, an added benefit of the scheme is the education and exposure to cyber security concepts in an easy to understand manner for children.
Learning Pairing-Based Cryptography by Hands-On Exercises

Stefan Rass, Johannes Winkler
Universitaet Klagenfurt, Austria

Many modern cryptographic schemes, especially those with special functionalities, employ elliptic curves and pairings thereon. While the cryptographic system itself may be quite simple to specify and write down, prototyping such a system to compute examples is often a significant independent challenge connected to understanding the system itself. Elliptic curves come with complicated group laws that rely on finite field arithmetic and depend on the particular instance of the underlying field. To get the grips on a cryptographic system, a student has thus to work out the fundamentals of finite field arithmetic, building elliptic curve group laws upon this, and finally, dig into the rich theory of pairings, before taking the first steps towards the cryptographic system. We report on work in progress on an eLearning system called SUNSET/FFAPL: SUNSET is a development environment for the programming language FFAPL (finite field application language), which offers finite fields and elliptic curves as native data types. Operations on those work in infix notation and via built-in functions, ranging up to elliptic curve groups and pairings thereon for cryptography. This work discusses various difficulties and challenges that students face in learning pairing-based cryptography and shows how to address them by hands-on exercises in SUNSET/FFAPL.
Exercation: Educating Students on their Exercise, Sedentary Behaviour and Screen Time Data. Engineering Technology to provide eHealth Awareness

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The research presented here started with an interest in finding a solution to the question of how to educate students about the need for exercise to offset increased sedentary screen time due to the expanding use of eLearning environments. With the saturation of active living technologies in the market place, the second objective was to increase people’s motivation to use self-monitoring physical activity tracking devices. These devices provide a wealth of data that if presented in an engaging format can educate users on their exercise and screen time behaviors, while suggesting areas for improvement. The proposed solution combines on-screen gamification technologies with exercise tracking goals. This research sometimes falls under different contemporary terms such as Edutainment or Exergaming, but we prefer the broader term Active Living Technologies. As we combine on-screen entertainment with traditional real world physical activities. Reviewing the literature in the respective areas helped with the development of an initial design that brings these two areas together.

The careful integration of Physical Activity Self-Monitoring Technologies (PAMTs) with Information and Communication Technologies (ICTs) provides useful data. Use of the data creates numerous opportunities for facilitating physical activity education through self-monitoring, peer competition, and accessibility to eHealth learning materials. We have coined a new term to encompass this innovative field: Exercation. That is, EXERcise EduCATION, specifically using ICT (Information and Communication Technology).
Teaching Keylogging and Network Eavesdropping Attacks: Student Threat and School Liability Concerns

Zouheir Trabelsi
UAE University, United Arab Emirates

Nowadays, teaching ethical hacking techniques has become a vital component of information security curricula that aim to produce knowledgeable students and competent information security professionals. Among the various offensive techniques, keylogging and network eavesdropping (also known as sniffing attack) are very common network attacks and important topics to information security education. The paper discusses what students and teachers need to know about keylogging and network eavesdropping attacks. The paper does so in the hope that it will encourage the teaching of these security topics when offering modules on information security. Then, the paper discusses the threat of teaching keylogging and network eavesdropping attacks, and proposes steps to minimize the risk of inappropriate student behavior and reduce institutional liability.
IT2017: Implementing a Modern Curriculum for Information Technology

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¹Peking University, China; ²Hofstra University, United States of America; ³Chengdu University of Information Technology, China; ⁴Shanghai Achievefun Info Tech Co., China

Participants attending this panel session will learn about the development of a modern information technology curricular report produced jointly by ACM and IEEE. They will interact with authors on ways to implement the recommendations of the report toward generating a modern curriculum for information technology. The objective is to ensure that this new document, tagged IT2017, becomes a viable tool toward molding a modern and forward-looking information technology curriculum at their locale and the world.
Effect of Secondary School Subject Choices on Performance of Sub-degree Students In Hong Kong – A STEM Perspective

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This study complements the reviews of STEM education in Hong Kong by other organizations from the perspective of sub-degree students. We investigate the effects of Hong Kong Diploma of Education Examination (HKDSE) results on the academic performance of STEM and non-STEM sub-degree students. Our study finds that among the four core subjects, English has the biggest impact on performance of sub-degree sub-degree students, followed by Mathematics Compulsory Part. Mathematics Extended Part and Science subjects are also found to have association with performance of sub-degree student and the effect of Science subjects is stronger among STEM students as compared to non-STEM students.
Integrative Learning in K-12 STEM Education: How to Prepare the First Step?

Gary K. W. Wong
The University of Hong Kong, Hong Kong S.A.R. (China)

Science, technology, engineering and mathematics (STEM) education has become one of the fastest growing trends in curriculum development around the globe. Integrated STEM education undoubtedly forms a new multifaceted phenomenon in education to prepare students to meet the new challenges of the 21st century. Science, Mathematics, and Technology education have always been a part of the K-12 curriculum as individualized disciplines. However, engineering is rarely taught in primary schools, and schools have no empirical experience of how to develop and implement an integrated STEM curriculum for students at the early age. In this project, an exploratory study of design-based research on integrated STEM curriculum with a local primary school in Hong Kong is reported. Through this study, it provides the first-hand experience of how integrated STEM education may be designed and implemented in the future. The findings may help schools in K-12 recognize the challenges and opportunities in bring the integrative learning to students.
Teachers’ Readiness in Implementing Science, Technology, Engineering and Mathematics (STEM) Education from the Cognitive, Affective and Behavioural Aspects

Abdul Halim Abdullah¹, Raja Haffizah Soffia Raja Hussin¹, Sharifah Nurarfah S. Abd Rahman¹, Mohd Hilmi Hamzah², Umar Haiyat Abdul Kohar³, Juhazren Junaidi¹

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STEM is an acronym for Science, Technology, Engineering and Mathematics. STEM Education is among the agenda for the education transformation in Malaysia to face the challenges of the 21st century. It was given strong emphasis in the Malaysia Education Blueprint (MEB) 2013-2025 launched in 2012. As teachers are the agents of change in ensuring the success of this transformation, this study was conducted to identify the readiness among teachers in Malaysia towards the implementation of STEM education from the cognitive, affective and behavioural aspects. A survey method was used in this study involving 190 teachers. The instrument included a questionnaire that contained items on the readiness of teachers in implementing STEM from the cognitive, affective and behavioural aspects. The analysis of descriptive statistics was done using SPSS software. The results of this study show that the mean for teachers’ readiness in all three aspects studied are at a moderate level. However, the mean for teachers’ readiness from the cognitive aspect is higher as compared to the behavioural and affective aspects. This finding shows that, although teachers’ cognitive readiness level is high, from the behavioural and affective aspects, teachers are found to be less prepared to implement STEM Education.
A Conceptual Model of Integrated STEM Education in K-12

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Unlike traditional education experiences in which students' focus on individual subject areas separate from other subject areas, STEM education emphasizes on combining different subject areas in a way that integrates them together, connecting different disciplines together, and relating them to each other practically and coherently. STEM education has become such a global trend that an increasing amount of countries have realized that humanity’s future will be built on our capacity for innovation, invention, and creative problem-solving. To implement STEM education in schools, many countries have tried a variety of different strategies. The situation is no different in Hong Kong. There is a distinct lack of a coherent understanding of STEM education and on how to implement STEM courses inside of the curriculums. This paper will establish and propose a framework to provide concrete references and examples to schools in Hong Kong for integrating STEM courses into their curriculums. This article will also discuss a variety of suggestions related to STEM education; including the development and training of educational professionals will be considered.
Understanding the Role of Arts and Humanities in Social Robotics Design: An Experiment for STEAM Enrichment Program in Thailand

Potiwat Ngamkajornwiwat\textsuperscript{1}, Pat Pataranutaporn\textsuperscript{2}, Werasak Surareungchai\textsuperscript{1}, Bank Ngamarunchot\textsuperscript{1}, Tara Suwinyattichaiporn\textsuperscript{3}

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It is known that among disciplines of science, technology, engineering and mathematics, STEM is not sufficient for building up innovation for the today and future world. Arts and Humanities are added up as a distinct mean of creativity to become STEAM. In Thailand as well as developing country has hardly seen to implement either in school or unschooling activity. We develop “STEAM Fab Model” consists of STEAM enrichment activities leading up to the fab challenge. We demonstrated the model using social robotics making as a tool for converging multidisciplinary knowledge. Apart from computer programming and electronic gadgets, enrichment of arts, culture, and social were implemented. We analyze student’s reflection and social robots created during the activity to understand how students learn and converge multidisciplinary knowledge.
The semester review of courses was conducted by the student engagement activities in addition to the traditional individual questionnaire in the university-wide system. Student representatives in years 2 and 3 planned their own review styles, namely the class survey/vote and workshop, respectively. For the program committee, the workshop report was more useful as it contained more information, namely the possible problem source and suggestions. Nonetheless, both evaluation methods were reliable with much more useful results than the traditional evaluation.
Determining the Dimensions of Motivation of Senior Maritime Students

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Maritime Academy of Asia and the Pacific, Philippines

There has been an increasing trend in the enrolment of maritime education in the Philippines. However, the motivations of students pursuing undergraduate maritime programs has been under-researched. The aim of this pilot study was to determine if maritime is their preferred choice in college, as well as to explore the factors contributing to their motivations. A motivation questionnaire composed of 45-item-Likert scale survey was carried out in July 2017 among 76 fourth-year students. Descriptive statistics, exploratory factor analysis (method of extraction: principal component analysis; method of rotation: varimax with Kaiser normalization) and reliability tests (Cronbach's alpha, Kaiser-Meyer-Olkin and Bartlett's test) were used to analyze the data. This pilot study indicates that majority of the students in the academy did not prefer the maritime program they enrolled in. The factor analysis revealed that the underlying factors why they pursued maritime education.
Outcomes-based Student Performance Diagnostic and Support Model

Robert Hans, Daniel Chuene, Roderick Lottering, Craven Lepota, Victor Ranko
Tshwane University of Technology, South Africa

The assessment of students’ knowledge by evaluating individual course learning outcomes (CLOs) will assist in providing students with targeted assistance. This will also assist in providing assistance to struggling students as early as possible in their course learning outcomes. Furthermore, such an assessment offers lecturers an opportunity to offer personalized assistance to students.

This paper proposes an Outcomes-based Student Performance Diagnostic and Support (OSPDS) model aimed at achieving the above-mentioned goals, amongst other things. The model is aimed at aligning CLOs with the assessment criteria (AC) as well as assessments (AS) for a given topic, determining student’s performance based on set CLOs, as well as proposing teaching and learning interventions for struggling students.

As a form of evaluating the proposed model, a prototype was developed based on the OSPDS model. The sample test results obtained from the prototype indicate that the OSPDS model does fulfill its set goals.
Developing self-directed learning skills among Malaysian university students has become one of the primary aims of adult education. However, we cannot assume that university students have already learned self-regulation, time management and project management upon entering campus. Neither have they learnt to be a self-directed learner by themselves. It is the teacher or instructor that must develop strategies that could support these students in becoming a self-directed learner by letting them to be responsible on their learning. To overcome this issue, Brockett and Hiemstra [3] suggest the use of online discussions to improve students’ interactions and collaboration that would eventually help them to become a self-directed learner. Thus, the purpose of this study was to address the question of how the use of online forum could promote self-directed learning among Malaysian tertiary students based on a conceptual framework developed from the integration of the staged self-directed learning (SSDL) [8] with the community of Inquiry model [7]. A purposive sampling of 35 students taking a multimedia subject at a Malaysian government university was selected. These students were further divided into 8 small groups. The main instrument used in this study was the online forum that captured online conversations from 8 small-groups. The transcripts derived from the online discussions among the students and the teacher/instructor were analysed using coding procedure developed from Garrison and Anderson’s [7] interaction analysis model. The findings indicated that the use of online forum could foster the development of learners’ skills of self-directed learning.
Supporting Better Formative Feedback In Task-Oriented Portfolio Assessment

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Task-oriented portfolio assessment is an innovative teaching and learning system that aims to support, encourage, and reward students in engaging in deep approaches to learning. Within this teaching and learning system, the need for teaching staff to provide frequent formative feedback is essential. In this paper, we reflect upon the use of task-oriented portfolio assessment in supporting introductory programming units, and propose some methods to measure and improve quality, as well as decrease time required to provide formative feedback. Furthermore, we explore how the Doubtfire Learning Management system is currently supporting this approach, and provide prospective improvements & research for such systems.
Exploring the Impact of Flipped Classroom on Students’ Acceptance of Programming in Secondary Education

On-sheung Yan, Gary Cheng
The Education University of Hong Kong, Hong Kong S.A.R. (China)

This paper explores and discusses the impact of flipped classroom on students’ acceptance of programming. Two Information and Communications Technology (ICT) classes of students, one in Secondary 4 and the other in Secondary 5, were involved in this study. Flipped classroom was adopted to teach programming in both classes. A pre-post questionnaire was designed to identify changes in students’ acceptance towards programming before and after the implementation of flipped classroom. The results of this study show that flipped classroom could improve students’ acceptance of programming and that students tended to agree with the use of flipped classroom to learn programming. Future work will be undertaken to collect and analyze qualitative data from students.
Student’s Characteristics and Programming Learning – A Macanese Perspective

Antonio Mendes¹, Anabela Gomes², Maria José Marcelino¹, Marcus Im³, Ke Wei³, Chan Tong Lam³

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Results in introductory programming courses are often disappointing. Several possible causes for this situation have been reported. This paper reports some results of an experiment where we tried to find correlations between novice student’s performance in an introductory programming course and some of their characteristics, namely previous programming experience, past grades (in general and in Mathematics), learning styles and motivation to the study area. The study took place during the academic year of 2016-2017 involving a group of Macanese students. A comparison with a similar experiment done previously in Portugal, involving two different groups of students, is also presented.
Teachers’ Perception of Professional Development in Coding Education

Runzhi Kong, Gary K. W. Wong
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Extensive studies have already documented the importance of introducing computer science into K-12 which lies in equipping students with computational thinking. The context in which this research is to be undertaken is in mainland China, Hong Kong, Brunei Darussalam. 107 participants in total involved in this research. The result of this study shows that 1) some primary school teachers still have misunderstanding on the concept of computational thinking. 2) lack of pedagogical content knowledge and content knowledge are major challenges teachers have in teaching programming. 3) non-cognitive factors, such as anxiety, confidence, always influence teachers’ teaching which cannot be neglected.
The Framework for the Integration of Computational Thinking in Ideation Process

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Computational Thinking (CT) is the new way of learning experience in this 21st century learning. It has been integrated through education in other developing countries like Australia, America and UK. In order for students and teachers in Malaysia to be equipped with this new skill, this research study has employed action research and qualitative research methodologies. A new framework known as CICP has been constructed to integrate CT in higher educational curriculum. This research study has also shown two different components of student’s learning experience
Does a Good Match of Trainees’ Learning Styles to Their Tutors’ Instructional Strategies Contribute to Trainees’ Academic Achievements?

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Over the last two decades Israel has experienced a rapid and extreme growth in diversity among students entering academia. In conjunction, the number of students with learning disabilities and learning difficulties has risen to twenty percent in a leading college. In earlier research, the match between students’ learning styles (LS) and their teachers’ instructional strategies (IS) and the correlation of this LS-IS match with students’ academic achievements was studied. Nevertheless, there is no report of research where one-on-one education is implemented. Moreover, there are no references about the match of a trainees’ LS to their tutors’ IS and the correlation of this LS-IS match with the trainees’ achievements as presented in the current paper. To measure the LS-IS match, two different methods were used. First, calculating the correlation between trainees’ LS and tutors’ IS (LS-IS correlation); second, calculating the LS-IS distance. Thirty-nine tutors were paired with 42 trainees with learning disabilities (three tutors had two trainees each) during the 2016 academic year. Thus, 42 pairs of tutors and trainees worked to help the trainees achieve better academic grades. The Felder-Soloman Index of Learning Styles (ILS) was used to measure the tutors’ preferred IS and the trainees’ preferred LS. In both methods, the LS-IS match was correlated with the trainees’ grades. If the LS-IS match influences the trainees’ achievements, significant positive correlations in the first method and significant negative correlation in the second method must appear. Nevertheless, the results show no significant correlation (positive or negative, accordingly) between the LS-IS match and students’ achievements at the end of the first semester of 2016 and again at the end of the second semester of 2016.
Knowledge-Based Architecture for Higher and Media Education to Stablish Strategic Alignment of Competences

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Abstract— The objective of this paper was to present an improved version of the previously developed Curricular Coherence Architecture (CCA), along with a brief reference to the related sector’s sociocultural situation which it aims to serve. The CCA is a linear analytical tool for academic information that enables the curriculum make sense as a whole complex, refering to the logical-cognitive relations between the parts of an educational system architecture (i.e. an academic program’s knowledge vs. professional competences and micro-competences); it’s an analysis instrument that provides optimization for an engineering curriculum, using propaedeutic cycles articulated with media education (ME), that weaves coherence and consistency in the internal and external architectural components. The CCA Matrix is a kind of macroscope for a great quantity of curriculum and competences information and knowledge, which allows the corresponding knowledge management.

The faced problem was the Higher Education (HE) Institutions (HEI) challenge to establish links between the traditional (technical, technological and professional) HE cycles and the secondary, basic and ME levels. The solution presented: links each phase with a propaedeutic component, which is discussed in an involving model; sets up a way towards the HEI’s architectural information, in respect to the Colombian 1188 Education Law, which is explicit about the curriculum complexity; and seeks to be an institutional learning instrument in the community that handles knowledge.
From these experiences it was expected that: HEI goes beyond the simple ICT management; an ethos for research and knowledge in the technical and technological institutions is entirely feasible; and, the propaedeutic cycles based policy, far from being a utopia, really enables the democratic way to knowledge, as proclaimed in the World Summits on Information Society (Geneva and Tunisia).

The tool design aims to: manage knowledge, enabling a morphologic analysis of an HE study plan; eliminate inconsistencies, make viable the curriculum optimization of the Institution Educational Plan, and contribute to develop a curriculum without errors and ambiguities; quantify the universities’ production from the students knowledge development (competence culture) by propaedeutic cycles, to redesign the expertise areas and the know-how in each cycle.

The included innovations are to: improve the prospective scope of the Institutional Strategic Plan including the alignment between target competences, micro-competences and knowledge (courses); and quantify the knowledge and micro-competences contribution of each curriculum subject in terms of its target competences.
Potentials and challenges of Using Flipped Classroom in Teaching Computer Programming

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Qatar University

Flipped classroom is gaining attention among educators in higher education, it is increasingly utilized in a variety of disciplines. Computer programming is an ideal course for implementing flipped classroom. In this paper, we discuss potential advantages of this model to improve students learning and overcome the difficulties that students face in this subject. However, adopting this model is not a straightforward task, it has different challenges, we review some of these challenges that should be considered when planning to implement this model in computer programming.
Teaching Internet of Things: Enhancing Learning Efficiency via Full-Semester Flipped Classroom

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This paper presents a full-semester adoption of flipped classroom in teaching Internet of Things development. Student-paced video lectures had been used, allowing students to have more flexibility in learning. By delivering lectures online, the course instructor can spend more time in class to conduct activities which encourage in-depth, active learning and student-teacher interactions. The process of preparing, implementing and evaluating the course will be described in the paper.
S: Paper Session
14 December 2017 (Thursday)

10:50-12:20  S3A: E-Learning
Location: Dr & Mrs Allen Shi Lop Tak Lecture Theatre (D1-LP-03)

S3B: Interdisciplinary Learning
Location: Lecture Theatre (D1-LP-08)

S3C: Online Learning
Location: Christina Ting Yuk Chee Lecture Theatre (D1-LP-07)

13:30-14:50  S4A: Engineering Education
Location: Dr & Mrs Allen Shi Lop Tak Lecture Theatre (D1-LP-03)

S4B: Learning Analytics
Location: Lady Ivy Wu Lecture Theatre (D1-LP-04)

S4C: Quality Assurance
Location: Christina Ting Yuk Chee Lecture Theatre (D1-LP-07)
15:00-16:20  S5A: Generic Skills
Location: Dr & Mrs Allen Shi Lop Tak Lecture Theatre (D1-LP-03)

S5B: Featured Discussions in Engineering Education
(Best Paper Candidate Session)
Location: Lady Ivy Wu Lecture Theatre (D1-LP-04)

S5C: Learning Technologies
Location: Christina Ting Yuk Chee Lecture Theatre (D1-LP-07)

16:40-18:00  S6A: Co-Learning and Motivation
Location: Dr & Mrs Allen Shi Lop Tak Lecture Theatre (D1-LP-03)

S6B: Educational Games
Location: Lady Ivy Wu Lecture Theatre (D1-LP-04)

S6C: Teaching Circuits and Systems
Location: Christina Ting Yuk Chee Lecture Theatre (D1-LP-07)
A Comprehension Based Intelligent Assessment Architecture

Sadhu Prasad Kar¹, Jyotsna Kumar Mandal², Rajeev Chatterjee³

¹Tata Consultancy Services, Block-EP&GP, Sector-V, Salt Lake City, Kolkata, India.; ²University of Kalyani, Kalyani, Nadia, West Bengal, India.; ³NITTTR, Block – FC, Sector-III, Salt Lake City, Kolkata, India.

In teaching and learning system assessment is measured to be an essential activity. In most of the automated learning systems, assessment is normally realized using automatic techniques where Multiple Choice Questions (MCQ) with respective answers and distractors are used. Conversely, in order to gauge the comprehension ability of learners, responses based on simple sentences, group of sentences and / or paragraph are necessary to be assessed by the system using automated tools / framework. This research activity is a footstep in this route, in which authors have suggested an automated assessment technique for brief answer type questions where multiple sentences are involved.
A propriety game based learning mobile game to learn Object-Oriented Programming - Odyssey of Phoenix

Yoke Seng Wong, Maizatul Hayati Mohammad Yatim, Wee Hoe Tan
Sultan Idris Education University, Tanjong Malim, Malaysia

In order to understand the significant of object-oriented programming, a propriety game-based learning mobile game has been designed and develops as a learning tool to improve the student understanding toward object-oriented programming paradigm such as encapsulation, abstraction, inheritance and polymorphism. The proposed game is a 2D role-playing mobile game named Odyssey of Phonies that allow players to learn Object-Oriented programming in an easy and interaction platform. Players will play along the flow of each game world and they will learn object-oriented programming paradigm easily. A group of 20 undergraduate degree year 1 student had been selected to participate the pilot study to determine the proposed game is able to improve their understanding toward object-oriented programming paradigm and determine the significant different between the traditional teaching and traditional teaching with game-based learning approach. Thus, this paper is a case study of an academic who worked with game designers, game developer to design and develop a propriety game-based learning game for learning object-oriented programming
Active Learning Modules for Multi-Professional Emergency Management Training in Virtual Reality

Ekaterina Prasolova-Forland¹, Judith Molka-Danielsen², Mikhail Fominykh¹,²,³, Katherine Lamb⁴

¹Norwegian University of Science and Technology, Norway; ²Molde University College, Norway; ³Volga State University of Technology, Russia; ⁴Effective Command, UK

In modern society there is interest for safer industrial workplaces and a growing need for cost effective training of personnel in emergency management work. Use of live trials as training modules to model emergency situations and prepare for crisis events can be expensive, risky, inflexible to adapt to alternate scenarios, and difficult to replicate. Therefore, virtual reality simulations for education and training offer new opportunities and are being increasingly adopted for such purposes. Quite often emergency situations involve a multi-professional team of medics, firefighters, police, and industry workers such as engineers who are working and co-located at the incident site. However, existing simulations for training typically focus on mono-professional teams, omitting the crucial communications and collaboration protocols from training modules. In this paper we discuss a project that has an objective to develop a new model for multi-professional Emergency Management education that involves use of virtual reality simulations. In particular, address the theoretical question of how combination of Activity theory and Naturalistic Decision Making/Recognition Primed Decision models can form the basis for a pedagogical model for multi-professional emergency management training. We present the design of the virtual reality simulation, learning scenarios and the results of the initial trials among various user groups. Finally, we identify the opportunities and challenges for applying virtual reality based learning environments for efficient and safe training.
Integrating Computational Thinking into English Dialogue Learning through Graphical Programming Tool

**Xiaojing Weng, Gary K. W. Wong**
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Developing students’ Computational Thinking (CT), which is an essential problem-solving skill for people living in the 21st century, becomes an outstanding purpose of promoting engineering education in K-12 classrooms. In this paper, CT is represented through the graphical programming language Scratch according to the three-dimensional CT framework proposed by Brennan and Resnick [1]. This project aims to explore the classroom effect of using graphical programming tool in learning English dialogue and investigate how to improve the integration of CT into English education with the elements of programming. To achieve these objectives, a qualitative method was adopted to collect data through class observations, programming projects, and semi-structured interviews. Nine primary students (n = 9) were the targeted participants, who attended extra-curricular lessons for computer programming using Scratch at their school in Hong Kong. The preliminary results show that the introduction of CT into English dialogue learning through graphical programming language can motivate primary school students to study English dialogue. To better connect CT with English education via graphical programming tools, students and the teacher in the group under study suggested making computers interact with people autonomically, designing games in graphical programming environments to encourage English learning, keeping the balance of students’ graphical programming language learning skill and their English language skill, and adopting graphical programming language as a tool to finish the summative English language assignments.
Developing an Automated Coding Tutorial OER

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Inspired by recent Open Educational Resource (OER) development successes in a Sino-foreign Higher Education Institution in China, we were motivated to explore the possibility of creating a new OER to assist in the learning of programming languages: an automated tutorial system for Java. The approach to this project has been influenced by the Students as Change Agents (SACA) programme, which emphasises student participation and influence on their own education experiences. This paper reports on this project as a work-in-progress, describing the background and motivation, and some related work, and presenting our proposed system. The approach to the development, and implementation completed so far are explained, and our on-going and future work are summarised.
Interdisciplinary New Product Development Projects
Extended Over Engineering and Management Courses

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¹President University, Indonesia; ²Universiti Teknologi Malaysia, Malaysia

It is common for university engineering students to learn each academic discipline in an independent course. By taking multiple courses during the program, they learn what are needed in their specialty in the future. In this situation, the students often have difficulty to relate the different areas learned in the separate courses, although they are able to learn each disciplinary in depth. The students have even more challenges if they try to connect engineering and non-engineering courses.

At the Department of Mechanical Precision Engineering in Universiti Teknologi Malaysia, each fourth-year student group works on a new product development project in an engineering and a management courses simultaneously. Even though these courses are maintained separately, the student groups work on this single new product development project through this interdisciplinary teaching method. They apply the design skills learned in the engineering course to develop the new product. At the same time, they apply new product development skills, which they acquire in the management course, to the same project. By extending the single project over the two courses, the students are able to see the project problems from multidisciplinary viewpoints. This project arrangement encourages the engineering students, who often do not show much interest in the management course, to concentrate on the course assignment. While the student groups work on the new product development projects, they notice the engineering and the management courses complement each other and actively participate in the project.
Teaching research methods for scientific research may not be as common as teaching the same course in social science. It may stem from the fact that scientific discovery process varies from one field to another. Hence, when such a course is designed to prepare science students who are new to research, it should be helpful to encourage students to learn it hands-on. In this study, we redesigned research methods course for computer science master’s students from a traditional lecture style to embrace an active learning approach. The newly-designed curriculum was exercised during Fall 2016 to teach 31 students majoring in computer science. We examined the course using authentic assessment, behavioral observation with its rubric template, and questionnaires. The results indicated that active learning is an effective pedagogy as students’ research skills were greatly improved statistically significantly at p-value less than 0.01. Students confirmed that they found active learning highly useful particularly for learning research presentation skills and writing skills.
The Demand of Entrepreneurship Training Program for Engineering Students

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This paper is a review of issues and challenges involving engineering students, engineering education, entrepreneurship education and the how these can contribute to the development of an entrepreneurial program in the effort to produce entrepreneurial engineer. The 21st. century has become challenging and demanding, engineering is becoming a profession that requires technical competency and professional skills. A redefine and innovative engineering talent and leadership are needed to address the challenges. Malaysian government and higher learning institutions are taking various initiatives to attract students to engineering and to prepare engineering students to practice entrepreneurial characters and leadership skills. To prepare students to enter the workforce and survive in the global economy, engineering graduates need to be able to be effective leaders, empathetic, resilient, creative, and ability to seize the opportunity. These qualities are to be instilled to engineering students to be entrepreneurial engineers. This study is aimed to collect data related to engineering graduate’s development and employment and entrepreneurship characters and skills among engineering students in both public and private universities. The findings of the study are significant as they gain an insight into the entrepreneurial potential and the present literature on the student’s characters and skills toward entrepreneurship education.
The Effect of Collaborative Learning Techniques in the Flipped Classroom Learning - Computer Ethics Course

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There are many findings that the active learning has higher performance than the traditional learning (lecture-based learning), especially the flipped classroom learning. Therefore, the classroom action research for collaborative learning techniques with the flipped classroom learning is studied. The objectives are to test the collaborative learning techniques with the flipped classroom learning and to analyze learning behaviors in learning willingness and critical thinking skill training. The research instruments consisted of a survey questionnaire for learners’ opinions about using collaborative learning techniques in the flipped classroom learning, the observation of learner behaviors and learning skills for class preparation and the group activities in class. The data collection methods are information gathering about learner’ opinions, learners’ behaviors about preparing for class, group working in class, including academic examination results and student grades. The findings conclude that all group activities of collaborative learning techniques supported the flipped classroom learning and helped learners to practice the critical thinking skills more effectively.
Facilitating Online Casual Interactions and Creating a Community of Learning in a First-Year Electrical Engineering Course

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The increase of online resources and the transition to a more "blended" course delivery in traditional face-to-face courses should be supported by an active and engaged online community to facilitate student-student and student-lecturer interactions. However, current learning management systems (LMS) and communication tools found within them do not assist this goal. The aim of this paper is to provide a brief review of online tools that are used or can be used for the purpose of facilitating student-student interactions, and also provides a first report on a trial in a first-year electrical engineering course at UNSW Sydney to create or facilitate a casual community of learning using Discord. Findings from formal and informal surveys, formal evaluations and informal conversations show that there is both interest and value seen by the students in both increasing engagement and improving learning. Higher education institutions should consider a more systematic approach in creating and maintaining engaged online communities.
In this paper, we describe how to investigate performance in a blended SPOC (small private online course). For the quantitative research, we build predictive models of students’ performance each week in a SPOC. We document a performance prediction methodology from raw logging data extracted from Open edX platform to model analysis. These logging data were collected from Computer Structure Lab Course offering at Beihang University. We show how to extract meaningful information from the learning related educational data we gathered. 28 predictive features extracted for 377 students, and our model achieved an AUC (area under curve) in the range of 0.62-0.83 when predicting one week in advance. An early warning system is established to identify at-risk students in the SPOC, especially for the blended lab course. Furthermore, we could use the most important features to form the assessment for each student during the semester.
Online Design of an Advanced Analytical Engineering Course: Outcome of a Pilot Implementation

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Despite the growth of online and blended courses in recent years, there still seems to be an inhibition for developing such designs for advanced analytical engineering courses due to the complex nature of the topics and the time involved. This paper discusses the model of one such implementation, particularly for a large class, with special focus on the online design strategies and a rationale for using them. This pilot implementation was based on the initiative of the University of New South Wales (UNSW), Sydney, in 2017, to allow academics to deliver more engaging and active learning experiences to students. The idea was to create online materials that would augment face to face teaching, thus providing an opportunity for a blended delivery. The conclusions of this paper highlight the effectiveness via observations on improved student engagement and formal feedback from the students, compared to previous offerings of the same course.
Project Management SPOC with Animation

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There is a growing interest in Technology Enhanced Learning (TEL) in recent years. This study developed and implemented a Small Private Online Course (SPOC) for an undergraduate project management course with the use of a simulation game as learning activity. A set of animated videos are created to supplement the learning with the SPOC. The relationships between prior knowledge, satisfaction, learning motivation, and learning performance are examined. The study results also highlight some critical features for SPOC performance.
Video Conferencing as a Peephole to MOOC Participants

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Distance education gained considerable attention with the rise of Massive Open Online Courses (MOOCs). Given the significant role collaboration plays in practical computer science education on campus, it becomes evident that nowadays online course platforms mostly lack the necessary collaborative capabilities. We present a solution to support collaborative programming through video conferencing for practical exercises employed in MOOC contexts. Two user surveys showed that albeit users value the possibilities, privacy concerns remain. We therefore propose to additionally use the technology to face another challenge: MOOCs usually are conceptualized and produced to a large extent before the actual course runtime. Reaction on current events within the course is possible but requires insights on students’ problems. Course conductors can use the tutoring mode in our WebIDE to understand struggling students and potentially uncover topics that lack additional background material or need additional training exercises.
A Quick Prototyping Project for First Year Engineering Students
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A short prototyping project was offered to first year engineering students as an option in an introduction to engineering course. Students would implement functional machines by adapting from existing designs using digital prototyping and commercial standard components. The minimum necessary skills and tools that students in all groups had to be trained were the Autodesk Fusion 360 and assembling of components. Otherwise, the project topics and available resources would dictate other skills or tools that had to be learnt. Using successive short bursts of activities in supporting learning environment under a closed supervision of academic and supporting staff, the prototypes could be completed and tested within 3 weeks. The lasting contribution was the can-do attitude and quick mock-up skills that were sufficient for initial development of real products.
Effectiveness of Teaching and Learning Activities with Miniproject Development Towards Enhancing The Undergraduate Engineering Skills

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Modern education in engineering requires the lectures and syllabus to be an effective and innovative. This is in the point of view to produce high talented and creative engineers in providing solutions to the industries and communities. With regard to that, a study on the effectiveness of developing miniproject in the Embedded Design and Interfacing course has been conducted. This study was intended to measure the students’ satisfaction on the teaching and learning activities implemented throughout the course towards their success in the miniproject and engineering skills development. A survey was distributed to the students taking this course in Semester March – June 2017 in Faculty of Electrical Engineering, Universiti Teknologi MARA. It was found that, 60% of the overall students chose the lab session conducted during face-to-face lecture as the most effective method of teaching and learning activities that is able to help them in developing a good miniproject. Other activities conducted throughout the semester is shown to be significant as minimum of 30% of the overall students stated that the activities are the most effective method. Upon completion of the miniproject, more than 60 students have a thought that they had develop a very good engineering skills which include planning and organisation skills, hand-eye coordination, ability to undertake detailed and elaborate work, ability to identify, analyse and solve problems and enjoy computing and technical design. A comparative study which analyse the result of Question 3 from Test 1 and Test 2 indicated that, the programming skill for 80% and 44% students from class EE241S6B and EE241M6C respectively obtained higher Test 2 marks as compared to Test 1. Hence it can be concluded that the miniproject can help to enhance the student’s programming skill.
Enabling Systems Thinking for Engineering Students
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Recent developments in science and technology resulted in many advances in our daily lives and societal conditions. These developments resulted in increasingly complex engineering systems that tackle a wide range of societal needs. However, this also demands a broader skills set for each engineer working with these systems and his/her training must span a greater range than that available in conventional engineering curricula. In order to deal with complex engineering systems, an engineer needs to have a good grasp of various technical fields such as computing, electrical, and mechanical engineering as well as competence in soft skills and systems thinking skills. This paper presents our multidisciplinary and project-based approach to impart these skills to our engineering students. The module consists primarily of conceive, design, implement and operate (CDIO) elements and aims to link diverse fields of engineering as well as developing the soft skills and systems thinking skills of our students. It is a year-long component of our Diploma in Engineering Systems course and it is offered in the second year of the curriculum in order to invoke these skills earlier in students’ professional life. The design and implementation process in this module integrates various fields and skill sets which gives students a realistic experience in dealing with engineering systems. Before embarking on this module, students have already gained plenty of hands-on experience and project management skills through other project-based modules such as Introduction to Engineering and Engineering Prototyping in their first year. This paper will present details of this module and its implementation together with our preliminary evaluations and observations.
Outcome Based Evaluation of Curriculum Goals Completion for Engineering Education

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In engineering education certification, the graduation-requirements achievement evaluation is usually carried out by use of curriculum-score-analysis method. The traditional curriculum scores consist of the final exam scores, attendance marks, in-class-tests’ scores and other indicators, which have no connection with the graduation outcomes. The teachers organize teaching activities without knowing what kind of teaching practices have most contributions to the graduation requirements. In this paper, we take the basic compulsory curriculum "The principles of imaging sensors" of the specialty of remote sensing science and technology (School of remote sensing and information engineering, Wuhan University) as an example and proposes the curriculum-goal-completion evaluation method to replace the traditional curriculum score analysis. We study the definition and the decomposition of curriculum goals based on the graduation requirements. Then the assessment of the course, the choice of teaching content and the organization of teaching methods are carried out to complete the curriculum goals. Through the research we transform the traditional test score based curriculum assessment to the “curriculum-goal-completion” evaluation which is consistent with the ‘Outcome Based Education’ concepts. We also adopt a reasonable and systematic approach to calculate the curriculum-goals-completion percentage. Our work will provide supports for the continuous improvement of engineering education and references for the national engineering education certification.
Teaching Engineering Ethics and Laws in the Light of the Carolinian Vision

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In May 2003, the United Nations Educational, Scientific and Cultural Organization (UNESCO) through its World Commission on the Ethics of Scientific Knowledge and Technology identified seven factors in the rising interest on ethics. The same document identified five partial aims of teaching ethics. Recommendations on what topics are to be covered and how assessment and evaluation are to be done were also mentioned in the document. It was with these insights that the revised course on ethics and laws for undergraduate fifth-year electronics engineering students was designed along outcomes-based teaching and learning approach. This paper presents the results of a course development on engineering ethics and laws by a non-expert/ethicist. Students professed the ethics they will adhere to in the practice of their profession and in their personal lives. They animated the content and intent of their personal and professional code of ethics and related principles and laws through course-specified assessment. Finally, they planned their way of life to achieve areté (excellence) in the light of Carolinian ideals of scientia, virtus, and devotio. The interventions used to assess whether the intended outcomes have been achieved are presented and described in detail. An evaluation questionnaire was distributed at the end of the semester to seek out the change in attitude toward a code of ethics and the interpretation of interventions as to the outcome being assessed. The collated result showed some unexpected items in the interpretation of the outcomes being assessed in a particular intervention and positive improvement of personal inclination to deliberate a decision on ethical issues in the light of Carolinian vision.
Enhancing an Automated System for Assessment of Student Programs using the Token Pattern Approach

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It is now common to use automated systems for assessing students' computer programming exercises. Many existing systems determine the correctness of a program by matching its output strings with the ones pre-defined by the instructor. As a result, even when a student's program would be accepted as correct if marked by a human assessor, it is easily rejected by existing automated assessment systems as incorrect due to minor non-conformance of the program output. This technical limitation of existing systems is frequently a source of student complaints and frustrating learning experience. Common patches to these systems by simple pre-processing before matching the output strings are not satisfactory solutions. Recently, a token pattern approach has been proposed as a better solution by comparing the output tokens instead of characters. In this paper, we report our work of enhancing an existing automated program assessment system in our university by integrating it with the token pattern approach. Our preliminary evaluation shows that the enhanced system does improve the present state in that (1) it achieves progress towards more flexible assessment in a way closer to what a human assessor would normally do, and (2) more programming exercises are now assessable by the enhanced system with much reduced effort.
Children can learn programming using different tools. Understanding how the characteristics and features of each tool impact the learning effect will enhance learning. However, the impact of specific tools on the learning effect is unclear. In this study, we conducted a workshop to evaluate the characteristics and features of six tools on the learning effect. Our study reveals that the learning effect clearly differs between the six tools.
The traditional education mode has changed. With the revolution of network and information technology, some teaching methods shifted from classroom to networks, and that brings new way of learning, teaching and conversation for both teachers and students. There have been some e-learning platforms called LMS (Learning Manage System), which integrates abundant online educational tools. Our work has two aims: (1) to throw light on students’ behavior and learning situation for teachers. Therefore, they can improve the teaching process. (2) to develop an automatic evaluating system to help teachers select the students exempted from examination.
Prediction Models of Learning Strategies and Learning Achievement for Lifelong Learning

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Today’s rapidly changing in Technology Enhanced Learning (TEL) and Lifelong Learning Styles (LLS) are becoming a part of everyday life. This objectives of the paper is to develop a theoretical framework and provide perspectives of Learning Strategies (LS) and Learning Achievement (LA) for Lifelong learning at the high school in the Maha Sarakham province. The paper is focused on identifying the first steps needed to make learning academic achievement. The data gathering is collected from 668 students at Phadungnaree School, Maha Sarakham province. The method consists of three processes: data collection, data analysis and model development, and evaluation of model performance. The results of the study found that the factors that affect students are basic chemistry course (s30102), basic biology course (s30103), and physics course (s30101). Finally, the testing results and measurement the performance of the model are high scores (94.51%), which can be further developed into software applications and mobile applications.
A preliminary study on teaching quality assessment from the perspective of "Students as Customers"

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Higher education differs from country to country, region to region, and institution to institution. Despite the differences, the majority of higher education institutions aim at providing a good quality learning environment to their students. To achieve this goal, these institutions would employ high quality teachers, develop good quality and most up-to-date curriculum, and provide good teaching/learning facilities and environment to their learners. To understand how effective these “services” are, institutions would use teaching evaluation as the means to measure their teaching service quality. However, in spite of its long history, it is questionable whether those assessments are truly reflecting students’ perception on teaching quality as well as their satisfaction toward teachers’ performance. Built on top of PZB’s SERVQUAL service quality measurement instrument, a set of teaching evaluation instrument was developed. 50 questionnaires of a pilot test were collected and results reveal that the five PZB service quality dimensions, except empathy and tangible dimensions, have statistical significant impact on students’ satisfaction toward their teachers’ teaching performance, while, overall satisfaction toward courses are influenced by students’ satisfaction to their teachers and the PZB tangible dimension. Based on the preliminary findings, suggestions are made to educational practitioners to further improve their teaching service quality.
Impact of Outcome-Based Education on Software Engineering Teaching: a Case Study

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This paper investigates the impact of outcome-based education (OBE) on students’ learning achievement from a software engineering (SE) program. It is not easy to transform an SE curriculum from traditional knowledge-based education (KBE) method to OBE method since it requires us to identify the outcomes clearly and map the outcomes with the expected capabilities of students. We first give a briefing on our SE program and outline the curriculum, then investigate the impact of OBE in two selected courses in SE program, with the completion of one course being the prerequisite for admission into the other one. Experimental results show that OBE can greatly improve the learning effectiveness of students and teaching quality.
Outcome-Based Education System: An Approach for Continual Quality Control on Engineering Education

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Implementation of Continuous Quality Control (CQC) over engineering education is lucrative but arduous for academic decision-makers. Among various approaches to address CQC, the Outcome-Based Education (OBE) system has found universal acceptance. The accurate measurement mechanism, transparency of outcomes (programs/subjects) definition, revamping troublesome education process, are salient advantages of adopting OBE system. However, the OBE implementation strategy plays a crucial role to eventual satisfactory level. In this work, practical case of Buein-Zahra Technical University (BZTE) is studied. Simulation results reiterates the fact that strategic and efficient implementation of OBE-BZTE allowed increasing flexibility and manageability of education process. Results, further, exhibited that the improvement plans over top program Outcomes (PO) and lower Course Outcomes (CO) are advantageously possible depending on input and output quality controls.
Science and Technology Learning Quality Model - The Innovation of Smart School Alliances

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Taiwan has the world’s second lowest fertility rate. Low fertility rates and aging populations have become a challenge in education. To cope with this issue, this study organize Smart School Alliances by investing industrial resources to solve the transformation that students lack of friend and due to the distance that schools lack of the quality teachers. The Science and Technology Learning Quality Model modes of Smart School Alliances divided into four categories, Strategic Alliances and Joint Curricula between Schools, Online Cooperative Teaching and Learning, Innovative O2O Experiences and Joint Presentations, and International Cooperation with Global Schools. This study was research in a large-scale, empirical field demonstration that involved more than 500 schools and 20,000 teachers and students. Encourages students to enhance their competence in digital skills from a global perspective to spur education innovation through IT programs to fulfill the equal learning opportunities rights for the new generation.
Utilization Of ICTs In Quality Assurance And Accreditation Of
Higher Education: Systematic Literature Review

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Numerous studies and surveys have examined the utilization of Information and Communication Technologies (ICTs) in Higher Education (HE). However, the absence of studies that specifically investigate the utilization of ICTs in Quality Assurance and Accreditation (QAA) of HE led us to perform a Systematic Literature Review (SLR). This review mainly benefits QAA agencies and researchers interested in utilizing ICTs for QAA of HE. Several facts regarding ICTs contribute to QAA of HE are identified. 1) Compared to QAA agencies, Higher Education Institutions (HEIs) are more likely to implement ICTs. 2) Most of the ICTs in HEIs are for Quality Assurance (QA) and not Accreditation. 3) Most previous studies were conducted in Europe. These studies demonstrate that efforts have been made to align the QAA agencies and HEI QAA units with European Standards, resulting in ICTs utilization into European HEIs.
A Model of Identification and Adaptation of Learning Styles Based on Cognitive Inference

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A model of identification of learning styles based on the inference of a cognitive model by means of semantic ontological structures is proposed. The system identifies, controls and proposes changes in the learning model of a teaching system for long distance education with the goal of controlling the fulfillment of a study program of a subject. To prove the benefits of the ontology a teaching-learning process was experimented with in the Universidad Técnica de Ambato, obtaining improvements in its conceptualization.
Affecting Factors and Supporting Measures for International Student Mobility

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This paper would discuss the affecting factors to the international student mobility with referring to the recent student survey data obtained from Japanese students who currently study abroad, in order to improve the quality of the engineering education by enhancing the worldwide student mobility. The factors presented in this paper include both of the Japanese-distinctive and universal ones. Note that not only the latter but also the former can be possible guides and suggestions for further vitalization of Engineering education in Asia and the world.
Many engineering graduates join the workforce in various industries and encounter complex systems and processes in a highly competitive environment. Many engineering firms aim to boost their efficiency so that they can meet growing customer needs with shorter deadlines at minimal cost. Furthermore, many firms are lean and target to do more with limited resources. These challenges require more collaboration and team playing skills from engineers working in industry. In summary, engineering graduates need to be good team players, good communicators and social individuals. On the other hand, conventional engineering curriculum is highly specialized and demanding which leaves very little space and time for learning social skills and understand group dynamics. Furthermore, the pedagogical approach is mainly focused on individual effort rather than team work. Many times, this results in academically high achieving graduates that are lacking necessary non-technical skills. This paper will present our initiatives to cultivate team work and communication skills for our engineering students. We will elaborate methods used for team formation, resolving conflict and assessing team work and individual contribution.
The Interactive Effects of Coaching Styles on Students’ Self-Regulatory Emotions and Academic Performance in a Peer-Assisted Learning Scheme

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We examined the effects of tutors’ coaching on students’ academic performance, as well as the mediating effects of students’ self-regulatory emotions. The results of structural equation modelling (SEM) of data collected from a longitudinal field study with 297 respondents showed that facilitation coaching was significantly related to both self-regulatory emotions and academic performance. Four types of self-regulatory emotions (cheerfulness, dejection, quiescence and agitation) mediated the relationships involving facilitation coaching. Furthermore, the interaction between guidance and facilitation coaching was found to moderate the coaching - self-regulatory emotions relationships. Theoretical and practical implications are discussed.
Intrinsic Motivation Inventory is a self-report instrument used to assess participants' experience regarding a particular activity. This paper examined the psychometric properties of a revised Intrinsic Motivation Inventory in the context of computational thinking learning. A total of 400 students from 4th grade participated in the pilot study. The revised instrument measured students' intrinsic motivation from four dimensions: interest/enjoyment, perceived competence, value/usefulness, and relatedness. The main findings of the study are twofold: (1) primary school students showed moderate to high motivation to learn computational thinking through programming and CS Unplugged; (2) factor analysis revealed that single factor model and multifactor model had good fit indices. However, discriminant validity of multifactor model was poor, suggesting the existence of a general factor.
Principle-Guided Flipped Classroom Implementation Framework for Teaching Technological Contents

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The concepts of conducting flipped classroom are basically the same, yet the teachers still consider it too difficult to switch from traditional lecture to flipped classroom, due to the lack of practical model. This paper mainly evaluates three different technological courses that adopted the flipped classroom approach for one semester in The University of Hong Kong, according to the “Seven Principles for Good Practice in Undergraduate Education” proposed by Chickering and Gamson. The guidelines of good practices gleaned from the cases and suggestions for improvements proposed by authors in flipped classroom design is described, according to the seven principles. It is hoped that the findings in this paper can inspire on-campus teachers in the teaching and learning design in flipped classroom.
Designing Simulation Games for Information Systems Education – a Case Study in Teaching for Digital Marketing

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Given the previous successful adoptions of game-based learning (GBL) in Information Systems (IS) education, we have designed and adopted a simulation game for teaching of digital marketing concepts. A post-game survey was used to evaluate the outcome. A positive relationship was found between challenges and perceived learning and was partially mediated by engagement. Besides, the positive relationship between clear goals, game control, and perceived learning were partially mediated by engagement. Our results demonstrated that future simulation game designer may put engagement into consideration for educational simulation games design, thus to achieve better perceived learning by combining different game factors.
RankwithTA: A robust and accurate peer grading mechanism for Massive Online Open Courses (MOOCs)

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Massive Online Open Courses (MOOCs) have the potential to revolutionize higher education with their wide outreach and accessibility. One of key challenges in MOOCs is the student evaluation: The large number of students makes it infeasible for instructors or teaching assistants (TAs) to grade all assignments. Peer grading—having students assess each other—is a promising approach to tackling the problem of evaluation at scale. The user evaluations are then used directly, or aggregated into a consensus value. However, lacking an incentive scheme, users have no motive in making effort in completing the evaluations, providing inaccurate answers instead. To address the above issues, we propose and implement a peer grading scheme, RankwithTA. Specifically, considering that the quality of a student determines both her performance in the assignment and her grading ability, RankwithTA makes the grade each student received depend on both the quality of the solution they submitted, and on the quality of their review and grading work to incentivize students’ correct grading. Furthermore, the ground truth is incorporated, which utilizes external calibration by having some students graded by instructors or TAs to provide a basis for accuracy. The simulation results illustrate that RankwithTA performs better than the existing schemes.
Towards a Repository for Open Auto-Gradable Programming Exercises

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Auto-gradable hands-on programming exercises are a key element for scalable programming courses. A variety of auto-graders already exist, however, creating suitable high-quality exercises in a sufficient amount is a very time-consuming and tedious task. One way to approach this problem is to enable sharing auto-gradable exercises between several interested parties. School-teachers, MOOC instructors, workshop providers, and university level teachers need programming exercises to provide their students with hands-on experience. Auto-gradability of these exercises is an important requirement. The paper at hand introduces a tool that enables the sharing of such exercises and addresses the various needs and requirements of the different stakeholders.
Anatomy Learning by Virtual Reality and Leap Motion

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Anatomy is very interesting and vast field of biology to study structure and organs of living organisms, most importantly human body. It can be made more interactive and attractive by using advanced technologies such as Augmented and Virtual realities. With the aid of such technologies medical students and doctors can learn anatomy in the most effective way. It doesn’t even require more complex anatomical structures and hardware. This paper presents new, innovative, interactive and immersive learning system with the use of virtual reality and leap motion controller. With the help of 3-D modeling tools, we have created a virtual environment and anatomical structure consisting of skeleton and body organs. Leap motion has enabled us to make the learning interactive by using hand gestures and finger motions in virtual environment. In this way, we can interact with the structures and organs of human body and can explore them for detailed learning. The developed application provides the user to grab, pick, place, stretch, shrink and interact with the structures and organs. With such interaction, the user would have better understanding and experience of learning. The system is tested by 40 users by experiencing the developed application and their feedback is collected. The results show that the interactivity of system has level 4.6 (Likert scale of 5) and hand tracking is 4.9. These values indicated the systems interactivity and suitability for anatomy learning.
Lacking of appropriate learning facilities, the traditional approach to learn high-performance computing (HPC) is commonly theory-oriented without sufficient hands-on programming experiences. To improve the hands-on experiences of HPC learners, we design and implement a flexible and adaptive online HPC learning platform in this paper, called EasyHPC. This platform contains various online course modules such as quiz bank, interactive community, and virtual laboratory. In our system, various HPC theoretical and experimental learning activities can be conducted online, such as assigning HPC parallel programming tasks, and creating HPC questions and collecting students’ submissions. It is convenient for students to study HPC-related courses in our platform, submit course assignments, exchange ideas, and complete HPC programming tasks. Our preliminary learning trials have shown that our system can effectively improve the hands-on experience of our students by providing an integrated HPC learning and programming environment. Our students are able to achieve various HPC capstone projects in our platform to develop their system capability.
Exploring the Use of Virtual Environment for International Creative Education (Art & Design)

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Creative industries including education industry seek to utilize knowledge and information for generating a new approach. Literature provides for current potential of virtual worlds as an effective learning environment through connectivity, interactivity, and access to user-generated content. However, up to date, limited effort has been made on the use of virtual environment for international creative education (art and design), which is this paper focused on. In order to explore the possibility of exploiting the virtual environment to achieve meaningful learning of creativity, and provide insights of the current practice and the possibility of adopting the Virtual Learning Environment (VLE) in creative education (art & design), with a particular focus in art and design education, for the future investigation in this topic. A number of experiment cases have been conducted in VLE. 3D replica virtual art and design Studio/Gallery/Exhibition can facilitate students to explore the VLE as they would in reality accomplishing what is hard to achieve in a real-life studio while feeling engaged regardless different real-life geographic locations. In addition, intensive interactive features were implemented in the VLE for creative education, such as Portfolio Voting Box, Portfolio Presentation Board, Artwork Questionnaire, Interactive Architecture, and Time Event. The interactive features enable the learner-centered education and problem-solving process to be conducted, which can assist students to actively lead learning process for entertaining, experience sharing, and obtaining better understanding of the art and design concepts and skills associated with their learning
experience. Further, by participating the project-oriented and problem-based collaborative design workshop in VLE, students can collaboratively design and co-create artwork to attain better learning outcomes by collaborating, being, building, and expressing in the way that may not be possible in reality.
Homogeneous Group Formation in Collaborative Learning using Fuzzy C-Mean

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One of the issues in collaborative learning is forming groups based on criteria that have been determined before such as grades, learning style, free time, and others. Computer-Supported Group Formation (CSGF) is a research field which purpose is to automate this process so group formation can be done efficiently and effectively. This paper discusses a research on CSGF to form homogeneous groups using a Fuzzy C-Means Clustering method. The parameter used is learning styles according to Felder-Silverman model. The goal of the clustering is that all students can be grouped, without orphan students, the learning styles of learners among all members in each formed cluster are as similar as possible. The proposed method has been applied in two classes of 42 and 39 undergraduate students. The results show that the clustering goals can be achieved.
Augmented reality is influential in achieving experiential learning in several subjects. In a geoscience classroom where spatial thinking skills and visualization of real-world phenomena is key to enhance understanding, experiential learning through the use of augmented reality sandbox and augmented reality constructs can be very effective. Augmented reality is being successfully used for holistic training in critical applications of medicine, aerospace, robotics and now it is increasingly getting popular in formal education. Geoscience, being an observational science, poses a challenge for an educator as delivering an understanding of earth processes through geological time scales difficult to achieve in the confines of a classroom. Field based studies have always been complementing geoscience education but they are becoming a logistic headache for many educational institutions. Augmented reality, through the draping of virtual reality onto a physical model, presents a realistic simulation of earth processes which facilitates the design and implementation of experiential learning modes in a geoscience classroom. The current article discusses the Augmented Reality construct and its integration in tutorials aimed at achieving experiential learning for geoscience students. We also discussed extending the use of similar constructs for transitioning student understanding in real-world problems and applications.
Implement Cooperative Learning Activities via Cloud Application to Enhancing ICT Literacy Skills of Vocational Teachers

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The contribution of this research is to enhancing ICT literacy skills for vocational school staff in Laos. Besides, the implementation of selected teaching and learning strategy has helped participants to be accountable with the independent task while they all can improve their teamwork skills. The training topics focused on the ICT literacy skills which derived from the participants’ needs training analysis. Cloud applications and some electronic devices were introduced, demonstrated, and assigned to the participants. Most participants were the beginners in the information communication and technology (ICT) environment, but they were eager and energetic to improve their computer literacy skills. A cooperative learning strategy was applied in this training so that the participants could be more accountable in their tasks and help the team members in accomplishing the joint assignment. The research methods such as a survey, group discussion, and observation were applied. The results showed that most groups of participants completed the tasks, have gained more practical knowledge as expected, more capable when working as a team, and had a satisfaction in this training. They were more confident in utilizing the knowledge gained from their real work. In addition, the participants were more interested in participating in ICT training if it is available in the future.
An early warning model of student achievement based on Decision Trees algorithm

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Abstract—With the development of Internet applications, educational websites have been well developed. This means that more and more students acquire knowledge through the virtual classroom. The educational system will produce a large number of students' learning behavior data. It doesn't make sense if you just take student learning behavior data as pure data. We extract the students' learning behavior characteristics from these behavioral data, and then use the data mining algorithm to train the classifier. Then predict the final grades of the students. Warning students who have a risk of failing the exam in time according to the prediction results, and according to the characteristics of importance analysis make guidance to their learning behavior.
Vertically Integrated Projects (VIP) at Inha University: The Effect of Convergence Project Education on Learning Satisfaction

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Inha University, Korea, Republic of (South Korea)

Due to the advent of the 4th Industrial Revolution in the 21st century, people with abilities based on convergence thinking are required in various fields of society. In addition, there is a growing interest in emphasizing the innovation of knowledge through academic, industrial, and technological convergence, and in how to foster convergent human resources as the scope of creativity expands. To this end, it has become necessary to change educational practices in higher educational institutions. Inha University began developing a convergence education curriculum at the Innovation Center for Engineering Education in 2013 to cultivate undergraduate students with convergence competency. This paper describes the implications of the results of multi-year, multi-disciplinary convergence education and the effectiveness of various convergence education methods for continuous education improvement. The VIP (Vertically Integrated Project) course, which has been run every semester at Inha University since the spring semester of 2014, is designed to give students practical research experiences connected with the industry in advance and apply actual projects in which professors participate to undergraduate education. The curriculum is designed to improve students’ major knowledge, research skills, and collaboration skills by teaming up multi-year and multi-disciplinary students. In addition, the effectiveness of convergence education is analyzed through various student evaluations every semester, and based on the results, the students’ understanding of convergence education and the need for training convergent human resources in educational institutions are further expanded.
Current teaching and learning activities have move to a new era which the modules and lecture can be obtained through online resources only. However, the advantages of combining both online and offline methods cannot be neglected to ensure the students understand in detail the concept that they studied. Hence, in this paper, the effectiveness of both online and offline teaching and learning activities are studied in the Power Engineering course for electronic engineering program. The study is based on survey and analysis on final examination results which was conducted to understand the students’ perception and correlate with their achievement. A survey was distributed to the students taking this course in Semester September – December 2015 in Faculty of Electrical Engineering, Universiti Teknologi MARA. It was found that, more than 70% of the overall students chose the tutorial session conducted during face-to-face lecture as the most effective method of teaching and learning activities. 58% of the students think that they able to understand and explain in detail all the time on topic 3-phase system. From the final examination result, it is shown that 32 students able to get 90% - 100% range from total mark for question on the 3-phase system. Education background also influence the students’ result, where 30% of students from Diploma UiTM Dungun and Matriculation UiTM each scored A for final examination. Only 15% students from Matriculation KPT scored A and the failure also come from the Matriculation KPT. Hence, this study can be used in future to improve the method of teaching for topic which students less ability to understand and the method of teaching and level of attention given to students for different education background.
The influence of learners’ openness to IT experience on the attitude and perceived learning effectiveness with virtual reality technologies

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The increasingly complex operations in multinational business imposes the need of more advanced training tools to facilitate learners to understand the operations through an interactive and immersive way. This paper analyses the use of virtual reality (VR) technology, a more interactive, immersive and intuitive learning environment when compared to conventional teaching pedagogical development, in teaching complex cargo terminal operations. Learners, upon training with the novel scenes in VR environment, are evaluated with their perception and perceived learning effectiveness through the VR training. Through the learning in the three aspects, the intrinsic factor of individual, including openness to IT experience, influence the perceived usefulness of VR training and attitude towards learning, are reviewed. The study also reflects that learners with open attitude to experience new IT usage perceived more usefulness during the training with the support of VR environment. These learners, with comparatively more positive views, are more engaged in learning during the training.
An Efficient Framework for Game-Based Learning Activity

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The implementation of game-based activities for classroom learning is not a direct process. There is a need to address the factors that could contribute to student willingness in learning in such environment and providing a reliable metric to measure their actual engagement after the learning activity. In this paper, a framework which utilized the conventional gaming factors while applying design thinking process is adapted during the design of our game-based learning (GBL) activity. In addition, a composite engagement metric which addressed the unique nature of such learning activities is also proposed. The experimental results using the new composite metric shows that the activity designed using the proposed framework is successful in engaging the student's interest, providing them an environment for learning practical skills while having fun at the same time.
THINKLog: Interactive Learning for Supply Chain Management

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¹National University of Singapore, Singapore; ²Kummara Studio; ³Center for Research on Information & Communication Technology, Institute Technology Bandung; ⁴GameLab, Computer Science Program, Bina Nusantara University

Serious games have been used to facilitate learning and training processes with examples of implementation in healthcare and military training. It has learning objectives to help the players understand specific and complex concepts. This paper focuses on developing a board game, named LogicHub, to facilitate learning on Supply Chain Management (SCM). It serves as a face-to-face interactive learning tool that can be expended to cover variations of scenarios of SCM concepts. Using two interactive sessions with government officials, we are able to validate that LogicHub was effective in deepening the players’ understanding of SCM concepts.
What Computer Games Can Teach Us about Classroom Teaching?

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This was a phenomenology study that explored the potential use of gaming principles in classroom teaching. Eight secondary school students were interviewed. The aim of the interviews was to investigate the students’ experience and perceptions about gaming. The motivations (i.e. gaming principles) behind gameplay were identified and these motivations were pushed into the classroom teaching. Data collected has revealed that students like to play computer games mainly due to the role-playing task and the virtual social interaction. Learning from the gaming context, role-playing and collaborative activities should be adopted in the classroom teaching to motivate students to learn and develop various cognitive skills.
A Flipped Mode Approach to Teaching an Electronic System Design Course

Ediz Cetin², Chamith Wijenayake¹, Vidhyasaharan Sethu¹, Eliathamby Ambikairajah

¹The University of New South Wales, Australia; ²Macquarie University, Australia

This paper presents the active and collaborative learning based “flipped mode” approach taken to deliver a second-year electronics systems design course in an electrical engineering degree curriculum and reports on initial results from a longitudinal study undertaken to assess the impact of this course on the development of design skills of the students in future courses. The proposed approach was aimed at maximizing time spent on acquiring hands-on design skills, while providing students with necessary theoretical insights. Various projects undertaken by the students over the past four years, namely digital FM radio, GPS tracker and temperature and humidity control system, have imparted strong design skills and improved their ability for independent learning making them more confident of undertaking complex projects in the future. Course structure, phases of teaching and their pedagogical aims and assessment methodologies, and student feedback are presented. A double-blind cohort analysis carried out to evaluate the merits of the course and its flipped mode teaching methodology indicates that the design skills acquired in this course are retained by the students in subsequent years.
Accuracy problems' solutions in Analog Electronics course: Work in progress

Elena Trotskovsky, Nissim Sabag
ORT Braude College, Israel

A longitudinal study researching engineering students’ understandings of the concept of accuracy and error has been carried out during the last three years. The previous studies done by the researchers investigated general misunderstandings of the concept of accuracy and error among engineering students from different programs, and specific misunderstandings of those concepts among electrical and electronics engineering students in a Digital Electronics course. The studies showed insufficient students' understanding of these important engineering concepts. The current study researches students’ achievements in solving problems that relate to the concepts of accuracy and to basic analog electronics concept of non-linearity and models. The research was carried out in April - June 2017 during an Analog Electronics course and includes 48 participants. A mixed methodology was applied. Two similar questionnaires with simple problems concerning the concept of accuracy were designed and incorporated into the learning process. 15 open interviews with the students after solving the first questionnaire were carried out. Students' written explanations and interviews were analyzed. It was found that engineering students with inadequate understanding of basic accuracy concepts struggle with interpreting the concepts of analog electronics while solving problems related to the matter. A moderate improvement of the students' knowledge in the answers on the second questionnaire was achieved after filling out the first questionnaire and after the lecturer’s explanation of the concept in class. Including the issue in different engineering courses, using it in tutorials, labs and projects can improve students' understanding and their engineering skills.
Dual-Study Electrical Engineering at Al-Quds University in Palestine

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¹Al-Quds University, Abu Dies, Jerusalem, Palestine; ²GFA Consulting Group GmbH, Germany; ³The Cooperative State University Baden-Württemberg (DHBW) - Lörrach, Germany; ⁴The German Development Cooperation Agency GmbH (GIZ)

Dual studies was launched at Al-Quds University in 2015, which is aimed at contributing to raising the professional level of Palestinian youth, providing good job opportunities for students after graduation, as well as bridging the gap between the outputs of academic education and the needs and requirements of the Palestinian labor market. One major ingredient of Dual Studies is the Electrical Engineering program, which equips the student with both theory and practice at the same time. During the four years of studying in this program, the student spends half of his/her time in partner companies that are interested in employing electrical engineers. The full-time employment after graduation represents one of the major success indicators of DSEE that would be possible to assess when the first DSEE cohort will graduate and finish their study after two years.
Improving Students' Hands-on Experiences in Learning Signals and Systems

Hao Wen, Xu Duan, Wei Kui, Xiaojun Hei, Wenqing Cheng
Huazhong University of Science and Technology, People's Republic of China

The fast-evolving theory and technology development in electronic and information have been reshaping the telecommunication engineering curriculum due to the fundamental problem between the increasingly volume of knowledge and the limited study hours. It is even challenging to enhance students' engineering capability in a systematic approach. We have been designing and developing a telecommunication engineering pipeline and carefully design different modules of the curriculum for telecommunication engineering. The "signals and systems" is one of the fundamental theoretical course in telecommunication engineering. In this paper, we designed and implemented an experiment software tool to improve students' hands-on experiences in effectively learning rather abstract concepts, models and methods in signals and systems. This teaching tool was developed using the LabVIEW and Matlab hybrid programming to relax the demand of the programming background for the students. This tool consists of 15 lab modules for the discrete signal processing and the continuous signal processing. Using this tool, the students are able to design and implement the lab sessions integrated with a visual computing process and a virtual instrument interactive interface. Our pedagogy practice has shown that this tool quite improves the students learning performance, and more importantly inspires the enthusiasm and motivation of the students.
15:20-17:20  Poster Session
Location: Outside D1-LP-04

A Probe Into Maker Education Of College ---BUPT As an Example
Yingying Li, Hongpei Liu, Yang Ji
Beijing University of Posts and Telecommunications, China

An Efficient Method for Changing Undergraduate Students’ Addiction to the Computer Games into the Interest of Learning
Guo Chun Wan, Chuang Gao, Mei Song Tong
Tongji University, Shanghai, China

Analysis and Reform of Engineering Curriculums for Graduate Students in China
Mei Song Tong, Dan Wang, Guo Chun Wan
Tongji University, Shanghai, China

Analyzing Heterogeneous Learning Logs using the Iterative Convergence Method
Roko Krstulovic\textsuperscript{1}, Ivica Boticki\textsuperscript{1}, Hiroaki Ogata\textsuperscript{2}
\textsuperscript{1}Department of Applied Computing, University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia; \textsuperscript{2}Academic Center for Computing and Media Studies, Kyoto University, Japan
Case Study of Outcomes of Innovative Teaching methods adopted in Engineering Education in India

Saba Kausar Mubeenahmed Shaikh, Pradeep Bajrang Mane
AISSMS Institute of Information Technology, Pune-India, India

Design of An Augmented Reality Teaching System for FPGA Experimental Instruction

Qiwen Zhu, Yongming Tang
School of Electronic Science and Engineering, Southeast University, People’s Republic of China

Design of an Web-based Interactive Quantitative (IQ) Curriculum Map

Tzu-Hua Liao\(^1\), I-Wei Lai\(^2\), Kuo-Sheng Chin\(^1\)
\(^1\)Chang Gung University, Taiwan; \(^2\)National Taiwan Normal University

Development of a Blended Learning System for Engineering Students Studying Intellectual Property Law, and an Analysis of the Relationship between System Usage and the Knowledge Acquisition Process

Takako Akakura\(^1,3\), Taisuke Kawamata\(^1\), Koichiro Kato\(^2,3\)
\(^1\)Tokyo University of Science; \(^2\)Graduate School of Innovation Management; \(^3\)Kanazawa Institute of Technology
Engineering Accomplishment Cultivation for Engineering Education Accreditation oriented Higher Education Reform: An Empirical Research in NJUPT

Jianhua Shen, Haitao Zhao, Feng Tian, Wei Ji, Ting Li, Hong Zhang, Fei Li, Chonghu Cheng
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English-Medium Instruction in Engineering Education: Practices, Challenges, and Suggestions

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Factor Analysis on motivations of first year maritime students: A pilot study

Lawrence Charlemagne Gelua David, Francisco Jr. Sangalang Mariñas
Maritime Academy of Asia and the Pacific, Philippines

Fuzzy Signature Approach to Clarification of Subjectivity in Assessment of Metacognitive Skills Transfer

Issarapong Khuankrue¹, Chanen Munkong², Yasuhiro Tsujimura³
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Improvement of an Electronics Course Performance Using Computerized Homework

Jehana Ermy Jamaluddin
Universiti Tenaga Nasional, Malaysia

Improvement on Education Quality of Graduate Students Facing the Challenge of Big Data Era

Zhi Hong Qiu, Mei Song Tong
Tongji University, Shanghai, China

Mobile Device Aided Teaching and Learning of Electromagnetic Polarization

Eng Leong Tan, Ding Yu Heh
Nanyang Technological University, Singapore

Modular Virtual Simulation Experimental Resource Designing and Application for Optical Fiber Communication Course

Jianping Cheng, Fei Li, Jianhua Shen
Nanjing University of Posts and Telecommunications, People’s Republic of China

NECCA: Network-based Embedded Computers for Classroom Activities

Luisito Lolong Lacatan
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Open Educational Resource (OER) Adoption in Higher Education: Challenges and Strategies

Tianchong Wang¹, Dave Towey²,³,⁴
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Preferred Methods for Innovative Concept Generation in Engineering

Frank Michael Washko
Saint Martin's University, United States of America

REPDL: Research-oriented e-learning platform based on digital library

Xiaolong Xu, Kun Wang, Yan Deng, Tao Li
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Students’ Response on Implementation of Kahoot in the Classroom

Hashimah Hashim¹, Zambri Harun²
¹Universiti Teknologi MARA, Malaysia; ²Universiti Kebangsaan Malaysia, Malaysia

Study And Exploration About Quality Assurance System Of College Graduation Design Based On Cooperative Teaching

Haitao Zhao, Jianhua Shen, Chonghu Cheng, Yuting Zhang
Nanjing University of Posts and Telecommunications, People’s Republic of China
Towards a Student-centered Lab Design for Learning Principles of Communications
Zhengguang Xu, Wei Kui, Xiaojun Hei, Wenqing Cheng
Huazhong University of Science and Technology, People’s Republic of China

Towards Research-led Teaching Curriculum Development for Machine Learning Algorithms
Kevin Kam Fung Yuen
Singapore University of Social Sciences, Singapore

Utilizing Virtual Reality to Assist Students in Learning Physics
Foteini Grivokostopoulou1,3, Isidoros Perikos1,2,3, Konstantinos Kovas1, Michael Paraskevas2,3, Ioannis Hatzilygeroudis1
1Computer Engineering and Informatics Department, University of Patras, Greece; 2Computer and Informatics Engineering Department, Technological Educational Institute of Western Greece, Greece; 3Computer Technology Institute and Press “Diophantus”, Patras, Greece

Vocational Education and Training Policy and Its Learners - What Are The Links?
Mani Nallasamy
Box Hill Institute, Australia
The inaugural meeting of the IEEE International Conference on Teaching, Assessment and Learning for Engineering (TALE 2017) is held at the Education University of Hong Kong (EdUHK).

EdUHK is a publicly funded tertiary institution dedicated to the advancement of teaching and learning, through a diverse offering of academic and research programmes on teacher education and complementary social sciences and humanities disciplines.

EdUHK nurtures educators and social leaders who are intellectually active, socially caring, and globally aware, to become agents of change in the communities that they serve. It places great emphasis on research capability — our research will contribute to the advancement of knowledge, scholarship and innovation, with sustainable impact on social progress and human betterment.

EdUHK aims to be a leading university on education, creating an impact and defining the education landscape not only for Hong Kong but also the Asia Pacific region.
Acknowledgement

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Hong Kong Tourism Board: Discovery Hong Kong
http://www.discoverhongkong.com

TripAdvisor: Hong Kong Travel Guide
https://www.tripadvisor.com/Travel_Guide-g294217-Hong_Kong.html

Lonely Planet: Hong Kong Travel
https://www.lonelyplanet.com/china/hong-kong

Hong Kong Traveller
http://www.hong-kong-traveller.com

Openrice.com (HK Reastaurant Guide)

Yelp Hong Kong
Tours

The Old Victoria City Tour

"A rock island hardly a house has been built on it". This is what Queen Victoria described about Hong Kong in the early days when Hong Kong became a British colony. Indeed, at that time, Hong Kong was a rock island. However, the colonial officers, European traders and merchants did try their best to build up this Victoria City: they built this new land with statues, mansions, square and the Government Hill.

A closer look at the sites tells the British ideas of building up this Victoria City. The concepts of the rule of law are also manifested in the sites which give Hong Kong a head start to develop as one of the 4 Asian Dragons.

The tour will start from Statue Square and pass through the Old Supreme Court Building, Battery Lane where the Former French Mission Building and the St John’s Cathedral, the oldest surviving Western ecclesiastical building in Hong Kong, were. Take a break in a nostalgic coffee shop before continuing to Pedder Street to finish the tour.

| Cost: HKD550.00/pax, minimum 2 pax. |
| Duration: around 3-4 hours |
| Pick up: Shatin MTR Station |
| Cost includes: |
| • English speaking guide |
| • Round trip MTR tickets from Shatin to Central |
| • A coffee/tea at a local cafe |
Tours

Sheung Wan – The Chinese under the British Rule

Sheung Wan offers a nostalgic feel about Hong Kong, and sometimes, a short walk down the memory lane is all it takes to appreciate where we are today. While the British were busy building up the Victoria City, what was life of the Chinese under the British rule?

The Chinese merchants and businessmen made use of Hong Kong’s links to the mainland and the position as a free port to create trade and commerce, while the lower working class were not as lucky, and had to rely on their physical labour to earn a living, and resort to religious faith for comfort.

We will take you to Sheung Wan, at the border of the Victoria City, to look at the streets which are still bustling with trading activities, and the temples offering comfort for the working class people.

Cost: HKD550.00/pax, minimum 2 pax.
Duration: around 3-4 hours
Pick up: Shatin MTR Station
Cost includes:
- English speaking guide
- Round trip MTR tickets from Shatin to Sheung Wan
- A coffee/tea at a local cafe
Tours

Hong Kong Food Hunt

"We only fight with a full stomach". This is what the Chinese says.

Hong Kong is well known as the culinary capital where good food is abundant. Even local snacks you find on the streets are awarded with Michelin star status. The tour will take you to look for the local snacks: egg tart, Chinese herbal drinks, dim sum, rice noodles and more. You will learn more about our food culture and sample snacks which are not offered in restaurants. The guide will take you away from the traditional tourist areas to the local neighbourhood of Shamshuiipo for this unique food hunt. You will sample food in 5 different locations and a herbal drink. In addition to food, you will also visit local temples and a walk around a local market.

| Cost: HKD700.00/pax, minimum 2 pax. |
| Duration: around 3-4 hours |
| Pick up: Shatin MTR Station |
| Cost includes: |
| - English speaking guide |
| - Round trip MTR tickets from Shatin to Shamshuiipo |
| - Food sampling at 5 different locations and a herbal drink |