2016 IEEE Eighth International Conference on Technology for Education (T4E 2016)

Mumbai, India
2-4 December 2016
Table of Contents

Foreword ...........................................................................................................................................................................xi
Message from the General Chair ......................................................................................................................................xii
Conference Chairs ............................................................................................................................................................xiii
Program Committee Members ..........................................................................................................................................xiv

Session 1A. Development of Technologies to Support Education -1
A Pilot Study: Introducing HDL Lab Course for Effective Learning of Digital Design .........................................................1
    Arati S. Phadke and Sangeeta S. Kulkarni
A Pilot Study: The Effect of Using Virtual Laboratory on Students’ Conceptual Understanding in Mobile Communications ....................................................................................................................................................................................7
    Swati Mahajan, Sangeeta Kulkarni, and Anita S. Diwakar
Active Learning Explored in Open Elective Course: Internet of Things (IoT) ........................................................................15
    Meenaxi M. Ratkar, Padmashree Desai, and Jayalakshmi G. Naragund

Session 1B. Pedagogical Strategies and Interventions for Technology-Enhanced Learning -1
Improving Design and Functionalities of MOBIlearn2 Application: A Case Study of Mobile Learning in Metalwork Collection of Millennium Gallery .................................................................................................................................19
    Abdurrahman Jalil, Martin D. Beer, and Paul Crowther
Geometry via Gestures: Learning 3D Geometry Using Gestures ............................................................................................26
    Soumya Narayana, Prajish Prasad, Lakshmi T.G., and Sahana Murthy
Kinect Based Real Time Gesture Recognition Tool for Air Marshalls and Traffic Policemen ...................................................34
    Anusha Prakash, Swathi R, Stuti Kumar, Ashwin T S, and G Ram Mohana Reddy
Session 2A. Development of Technologies to Support Education -2

An Experience Report on Teaching Programming and Computational Thinking to Elementary Level Children Using Lego Robotics Education Kit .................................................................38
  Vidushi Chaudhary, Vishnu Agrawal, Pragya Sureka, and Ashish Sureka

Improving Classroom Discussions of Programming Assignments via Language Choice ..................................................42
  Ullas Aparanji and Viraj Kumar

Using POGIL to Teach and Learn Design Patterns — A Constructionist Based Incremental, Collaborative Approach .................................................................46
  Priya C. Lotlikar and Ramrao Wagh

Visual Specifications for Web-Application Programming Assignments ........................................................................50
  Vidhu Rojit, Sindhu R. Pai, Shruthi Kaivalya, and Viraj Kumar

Session 2B. Pedagogical Strategies and Interventions for Technology-Enhanced Learning -2

Teaching and Learning of Divergent & Convergent Thinking Skills using DCT .................................................................54
  Rumana Pathan, Ulfa Khwaja, Deepti Reddy, and Venkatesh V. Kamat

Attendance Monitoring in Classroom Using Smartphone & Wi-Fi Fingerprinting .................................................................62
  Anand S, Kamal Bijlani, Sheeja Suresh, and Praphul P

Smartphone Based Virtual Reality Systems in Classroom Teaching — A Study on the Effects of Learning Outcome ........................................................................68
  Ananda Bibek Ray and Suman Deb

Session 3A. Game-Based Learning -1

Designing a Game-Based Learning Environment to Foster Geometric Thinking .................................................................72
  Suchi Srinivas, Saurabh Khanna, Jeenath Rahaman, and Viraj Kumar

Collaborative Game Based Learning of Post-Disaster Management: Serious Game on Incident Management Frameworks for Post Disaster Management .................................................................80
  Sooraj K. Babu, Marcia L. McLain, Kamal Bijlani, R. Jayakrishnan, and Rao R. Bhavani

Online Educational Games-Based Learning in Disaster Management Education: Influence on Educational Effectiveness and Student Motivation ........................................................................88
  B. Thangagiri and R. Naganathan

Session 3B. Learning at Scale -1

Assessing the Efficacy of a Large Hands-on Silent LATEX Workshop .................................................................92
  Sohinee Ganguly, Kiran L. N. Eranki, and Kannan M. Moudgalya

Decoding Engagement in MOOCs: An Indian Learner Perspective ........................................................................100
  Anitha Kaveri, Sangeetha Gunasekar, Deepak Gupta, and Maheshwar Pratap
Automatic Identification of Subject Domain in Engineering Examination Questions ..............................................106
Vandana Rao, Vaishnavi S., Vaishnavi Kannan, and Viraj Kumar

Session 4A. Game-Based Learning -2
An Innovative Educational Environment Based on Virtual Reality and Gamification for Learning Search Algorithms .................................................................................................................................110
Foteini Grivokostopoulou, Isidoros Perikos, and Ioannis Hatzilygeroudis
A Novel Approach for Training Crane Operators: Serious Game on Crane Simulator .................................................116
Amal K. George, M. L. McLain, Kamal Bijlani, R. Jayakrishnan, and Rao R. Bhavani
Evidence Centred Approach to Measuring Learning Outcomes Amongst Management Students Using Epistemic Games ...............................................................................................................................................................................................120
Sandeep Rambhatla and Deepak Gupta

Session 4B. Learning at Scale -2
Determinants of Acceptance of Massive Open Online Courses .................................................................................................124
Shrikant Mulik, Nilay Yajnik, and Manish Godse
Estimating Attention and Understanding Level of Students in a Large Classroom Environment ..................................................................................................................................................................................................................128
Md Shakeel Iqbal Satikia, Pankaj Kumar, Samit Bhattacharya, and Venkatesh Tamarapalli
Peer Assessment of Oral Presentation: An Investigative Study of Using Clickers in First-Year Civil Engineering Class of a Reputed Engineering Institution .........................................................................................132
R. Tamil Selvi and G. Chandramohan
Role of Virtual Biology Laboratories in Online and Remote Learning ........................................................................................................................................................................................................................................136
Padnavati Manchikanti, B. Ramesh Kumar, and Vinay Kumar Singh

Session 5A. Assessment and Evaluation
A Score Recommendation System Towards Automating Assessment In Professional Courses .........................................................................................................................................................................................................................................140
Anirudh Kashi, Sachin Shastri, Akshay R. Deshpande, Jawahar Doreswamy, and Gowri Srinivasa
Are We Asking the Right Questions to Grade Our Students In a Knowledge-State Space Analysis? ........................................................................................................................................................................................................................................144
Rania Aboalela and Javed Khan
Automatic Generation of Question Paper from User Entered Specifications Using a Semantically Tagged Question Repository ........................................................................................................................................................................................................................................148
Gauri Nalawade and Rekha Ramesh
Designing Item Banks in Alignment with Course Outcomes for Engineering Courses ........................................................................................................................................................................................................................................152
Shilpi Banerjee, N.J. Rao, and Chandrashekar Ramanathan
Development of a Reading Skill Test to Measure Basic Language Skills ..........................156  
Akira Fujita, Naoya Todo, Shingo Sugawara, Kyo Kageura, and Noriko H. Arai

Teaching Computer Programming Using MOOCs in Multiple Campuses: Challenges and Solutions ..........................................................160  
Tathagata Ray, Aruna Malapati, and N.L. Bhanu Murthy

Session 5B. Development of Technologies to Support Education -3

Geneticus Investigation: An Agent-Based Modeling System for Teaching-Learning  
Hypothetico-Deductive Reasoning in Mendelian genetics ..................................................164  
Anurag Deep, Sahana Murthy, and Paike Jayadeva Bhat

An Eclipse Plugin to Assist Learners in Selecting Hash Functions .......................................172  
Amogh Mishra, Kishan Kishore, and Viraj Kumar

Architecture for User Experience Tracking and Analytics in National Digital Library (NDL) ..............................................................176  
Poonam Anthony, Poonam Anthony, and Plaban Kumar Bhowmick

SEQUEL Based Learning Environment for Development of Multiple Representations (MR) skills .........................................................................................180  
Archana Deshpande and Madhuri Mavinkurve

Stereoscopic Three-Dimensional Visualization for Immersive and Intuitive Anatomy Learning ...........................................................................184  
Kup-Sze Choi, Shu-Ting Chan, Colman Ho-Man Leung, and Yim-Pan Chui

Session 6A. Learning Analytics

Dynamic Learning Path Prediction — A Learning Analytics Solution ................................188  
Kannan Govindarajan, Vivekanandan Suresh Kumar, and Kinshuk

Learning Analytics to Identify Students At-risk in MOOCs .................................................194  
Srilekhshmi M., Sindhumol S., Shiffon Chatterjee, and Kamal Bijlani

Ad Hoc vs. Organised Orchestration: A Comparative Analysis of Technology-Driven Orchestration Approaches ......................................................200  
Lighton Phiri, Christoph Meinel, and Hussein Suleman

Auto-Tagging for Massive Online Selection Tests: Machine Learning to the Rescue ........204  
S. Krithivasan, S. Gupta, S. Shandilya, K. Arya, and K. Lala

Session 6B. Technologies to Improve Access to Education -2

Tracing Phonological Processing Skill in Early Childhood Through iSAT ..........................208  
Man Ching Law, Rwitajit Majumdar, and Khe Foon Hew

An Experience Report on Teaching Compiler Design Concepts Using Case-Based and Project-Based Learning Approaches .......................................216  
Divya Kundra and Ashish Sureka
Developing Key Performance Indicators Framework for Evaluating Performance of Engineering Faculty ................................................................. 220
   Sangeeta M. Joshi, Shrabanii B. Bhattacharjee, Vishwas C. Deshpande,
   and Milind Tadvalkar

Experience Report: Guiding Faculty & Students to Participate in Humanitarian FOSS Communities ................................................................. 224
   Clifton Kussmaul

Stringing Subtitles in Sign Language ......................................................................................................................... 228
   Tejas Dharamsi, Rituparna Jawahar, Kavi Mahesh, and Gowri Srinivasa

Availability, Access and Utilization of E-Resources among Pre-Service Teacher Trainees by Distance ............................................................. 232
   Sunday O. Olaniran, M. A. N. Duma, and D. R. Nzima

Poster Papers

A Tool for Visualizing Concurrent C Programs Using Graphs .................................................................................. 236
   Harshil Sokhadia and Anish Mathuria

Adaptive Learning System for Analysis of Performance and Learning Behavior of School Children .................................................................................. 238
   Isha Oke, Pooja Kulkarni, Tanvi Lolap, and Yashodhara Haribhakta

An Experience Report of Flipped Classroom Strategy Implementation for Java Programming Course ................................................................. 240
   Trupti S. Indi

Augmented Exer-Learning Tool Using Ultrasonic Depth Visualization of Movement ................................................................. 242
   Sonia Nandi, Suman Deb, and Mitali Sinha

Building Software Testing Skills in Undergraduate Students Using Spiral Model Approach .................................................................................. 244
   Gopalkrishna Joshi and Padmashree Desai

e-Rubrics: A Formative as Well as Summative Assessment Tool for Assessment of Course and Program Outcomes ................................................................. 246
   Sandeep S. Ahankari and Abhijitkumar A. Jadhav

e-TLX (enhanced Tangible Learning eXperience) — An HCI Tool for Augmented Teaching Interaction ................................................................. 248
   Mitali Sinha and Suman Deb

EG-Easy: Design and Testing of Blender-Based Tool to Teach Projections in Engineering Drawing ................................................................. 250
   Ujjal Mavinkurve and Devansh Verma
Engineering a Better Tomorrow by Bridging the Quality Gap in Education Through Project Based Learning Using ICT e-Yantra-Robot Enhanced Teaching in Engineering Colleges ........................................................................................................252

Kiran J. Burle, Sandeep S. Ahankari, and R. A. Kanai

Modeling Academic Performance using Subspace Clustering Algorithm .................................................................254

Dimple V. Paul, Chitra Nayagam, and Jyoti D. Pawar

Modeling and Kinematic Analysis of Industrial Robots in WebGL Interface ...............................................................256

Ujjal Dey, Pabitra K. Jana, and C.S. Kumar

Open Ended Approach to Empirical Learning of IOT with Raspberry Pi in Modeling and Simulation Lab ........................................................................................................................................258

Soumya S. Patil, Supriya Katwe, Uma Mudengudi, Rajashekar B. Shettar, and Priyatam Kumar

Planning of a Microwave Engineering Course guided by Graduate Attributes and Bloom’s Taxonomy ........................................................................................................................................260

Freda Carvalho and Ashwini Kotrashetti

Project Based Learning for Internet of Things and Data Analytics: Experience Report of Learning from ET601X ........................................................................................................................................262

K.G. Srinivasa and Sowmya B J

Technology-Based Learning system in Programmable Logic Controller Education .............................................................264

A.B. Gavali, S.A. Patil, and A. R. Koli

Author Index ............................................................................................................................................................266