Editorial for EAIT issue 3, 2021

Arthur Tatnall¹

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Education and Information Technologies (EAIT) is the official journal of the Technical Committee on Education (TC3) of the International Federation for Information Processing (IFIP). It is a research journal that covers the complex relationships between information and communication technologies and education, from the micro of specific applications or instances of use in classrooms to macro concerns of national policies and major projects; from classes of pre-schoolers to adults in tertiary institutions; from teachers and administrators; to researchers and designers; from institutions to open, distance and lifelong learning. The journal's breadth of coverage allows EAIT to examine fundamental issues at all levels, discuss specific instances and cases, draw inference and probe theory. This journal is embedded in the research and practice of professionals and has been accepted into the Social Science Citation Index (SSCI) in the category 'Education & Educational Research'.

A computer science and robotics integration model for primary school: evaluation of a large-scale in-service K-4 teacher-training program. Is the first article in this issue and comes from many authors: Morgane Chevalier (MOBOTS Group of the BIOROB Laboratory, Ecole Polytechnique Fédérale de Lausanne (EPFL)-Switzerland and University of Teacher Education (Haute Ecole Pédagogique) Vaud, Switzerland), Gabriel Parriaux and Jean-Philippe Pellet (University of Teacher Education (Haute Ecole Pédagogique) Vaud, Lausanne, Switzerland), Jacques Lanarès (Swiss Graduate School of Public Administration (IDHEAP), University of Lausanne, Switzerland), Jessica Dehler Zufferey (LEARN – Center for Learning Sciences, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland) and Francesco Mondada (MOBOTS Group of the BIOROB Laboratory, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland and LEARN – Center for Learning Sciences, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland). They note that integrating computer science (CS) into school curricula has become a world-wide preoccupation and their article presents a CS and Robotics integration model and its validation through a large-scale pilot study in the administrative region of the Canton Vaud in Switzerland. Their article describes a mandatory CS continuing

✉ Arthur Tatnall
Arthur.Tatnall@vu.edu.au

¹ Victoria University, Melbourne, Australia

professional development program (CPD) of adapted format with a curriculum scaffolded by instruction modality that included CS Unplugged activities that aim to teach CS concepts without the use of screens, and Robotics Unplugged activities that employed physical robots, without screens, to learn about robotics and CS concepts.

Next, Rana Saeed Al-Marooif (Al-Buraimi University College, Oman), Aseel M. Alfaisal (Arar Community College, Kingdom of Saudi Arabia) and Said A. Salloum (University of Sharjah, United Arab Emirates) offer: ***Google glass adoption in the educational environment: A case study in the Gulf area***. They point out that few universities and colleges have adopted Google Glass as the integration of the technology phenomenon has not been widely explored. In this paper they relate an investigation of Google Glass adoption in the Gulf area. This paper reports on the design of a framework that links the Technology Acceptance Model (TAM) with the well-known effective features of the device, including teaching and learning facilitator and learning motivator, ‘functionality’, and trust and information privacy to enhance communication between teachers and students in the classroom.

In the paper to follow, ***Investigation of classroom management skills by using eye-tracking technology***, Atakan Coskun and Kursat Cagiltay (Middle East Technical University, Turkey) relate research to show how wearable eye-tracking technology can be employed to assess and enhance classroom management skills by analysing the instructors’ eye movements in a university. Their research also evaluated instructors’ gestures by recording with a video camera synchronized with eye tracking data. They found that the wearable eye tracker gives informative feedback about the visual attention of the instructors and provides meaningful data by video recordings and Retrospective Think Aloud sessions. It also demonstrated how the instructors interacted with classroom technology.

The next article is from Russia and is by Vasily Movchun, Richard Lushkov and Nikolay Pronkin (I.M. Sechenov First Moscow State Medical University (Sechenov University), Moscow, Russian Federation): ***Prediction of individual learning style in e-learning systems: opportunities and limitations in dental education***. Their article investigates the prediction model of an individual learning style in e-learning systems to enhance the effectiveness of dentistry education and makes use of Neil Fleming’s VARK concept of information perception. Statistical data of the Russian Federal State Statistics Service on students’ distribution in the field of preparation of dentists in higher educational institutions for 2018–19 was used to assess the current state of development of dental education and the possibilities of introducing e-learning systems. The correlation analysis of the relationships between different learning styles revealed a close relation between auditory and visual learning with the visual style less developed.

Contextualized mobile game-based learning application for computing education. Is an article by Alok Kumar Yadav and Solomon Sunday Oyelere (University of Eastern Finland). Their paper presents an overview of a mobile game-based learning application, BaghLearn that develops and upsills programming and algorithmic knowledge by cross-curricular capabilities through a traditional world-based game. The focus of their research was to explore learning effectiveness of BaghLearn and integrating learning with a contextual mobile game as an effective approach in

understanding the influence of games towards cognitive achievements of students in computing education. There are no major requirements for the use of this application so it can be used in resource-constrained contexts. The study evaluated the influence of BaghLearn towards learning design and analysis of an algorithm course, which is compulsory for most undergraduate computing education programs.

Finding satisfaction: intrinsic motivation for synchronous and asynchronous communication in the online language learning context. From Daniel Bailey (Konkuk University's Glocal Campus, South Korea), Norah Almusharraf (Prince Sultan University, Saudi Arabia) and Ryan Hatcher (Hannam University, South Korea) points out that intrinsic value is related to intrinsic motivation and influences learners' decisions to begin, continue, and return to learning tasks. In the context of a fully online foreign language English course, they explored motivation for asynchronous collaborative writing practice, motivation for video-synchronous speaking practice, course satisfaction, and the mediating effect course satisfaction has on behavioural intentions to use language learning technology. Cross-sectional survey results revealed that students who were motivated by asynchronous online collaborative writing were more likely to enjoy online learning in general when compared to students who reported motivation for video-synchronous online speaking practice.

Researchers have shown that knowledge acquisition and sharing have considerably influenced the acceptance of various technologies say Mostafa Al-Emran (Universiti Malaysia Pahang, Gambang, Malaysia), Vitaliy Mezhuyev (FH JOANNEUM University of Applied Sciences, Austria) and Adzhar Kamaludin (Universiti Malaysia Pahang, Gambang, Malaysia) in their article: ***Is M-learning acceptance influenced by knowledge acquisition and knowledge sharing in developing countries?***. They point out that there is scarce knowledge on how these factors affect acceptance of M-learning and make use of the Technology Acceptance Model (TAM) to understand the impact of knowledge acquisition and knowledge sharing on M-learning acceptance. Their findings showed that knowledge acquisition has a significant positive influence on perceived ease of use and perceived usefulness of M-learning.

The effect of the Internet of Things (IoT) is so strong that it has changed our way of living, and ***Effect of integrating IoT courses at the freshman level on learning attitude and behaviour in the classroom.*** By Shivani Malhotra, Amit Kumar and Rubina Dutta (Chitkara University Institute of Engineering and Technology, Chitkara University, India) looks at this. Statutory technical training bodies have made IoT a mandatory course in engineering education, but in terms of design and instruction, implementing this course is difficult, and their paper focuses on design and implementation of such a course.

Learner satisfaction, engagement and performances in an online module: Implications for institutional e-learning policy. From Yousra Banoor Rajabalee and Mohammad Issack Santally (Mauritius Institute of Education and University of Mauritius Reduit, Mauritius) analyses student feedback and reports findings of a study of the relationships between student satisfaction and engagement in an online course with their overall performances. This was tested mainly through continuous assessments and was designed using a learning-by-doing pedagogical approach. The focus was on the acquisition of new skills and competencies, and their application

in authentic mini projects throughout the module. Students were generally satisfied with the learning design philosophy, irrespective of their performance levels.

Volkmar P. Engerer (University of Copenhagen, Denmark) then writes on *Implementing dynamicity in research designs for collaborative digital writing*. The paper presents a dynamic (temporal and local) research design for collaborative digital writing (CDW) in higher education assignments. The design identifies current state-of-the-art approaches to digital writing and introduces components of text (the process and products of writing and learning communication), external variables such as learning orientations and group composition, an intermediate layer of time management that is related to organising the assignment, and the sphere of knowledge construction. It also looks at four additional features specifically connected to time-related aspects: micro-analysis, dynamicity, writer relevance and source status. This dynamized research design is applied in a study of writing assignments with students of information science.

The effectiveness of the GeoGebra Programme in the development of academic achievement and survival of the learning impact of mathematics among secondary stage students. Is by Mansour Saleh Alabdulaziz, Sarah Mubarak Aldossary, Sahar Abdulaziz Alyahya and Hind Muhareb Althubiti (Imam Abdulrahman Bin Faisal University, Saudi Arabia). Their approach consisted of a quasi-experimental design comprising an experimental group and a control group, each of female third grade students of secondary stage with pre, post, and deferred assessments for both groups. Results showed the experimental group as superior to the control group in achievement scores and survival of learning impact. Based on the findings, the researchers recommend the inclusion of GeoGebra program in mathematics curricula at various stages of education.

The authors' aim in the next article was to highlight the key elements related to the implementation of new technologies in education from the perspective of the opinions and experiences of educators in the field in Bolivia, Brazil, the Dominican Republic, Ecuador, Finland, Poland, Turkey, and Uruguay. It is titled *Are teachers techno-optimists or techno-pessimists? A pilot comparative among teachers in Bolivia, Brazil, the Dominican Republic, Ecuador, Finland, Poland, Turkey, and Uruguay*. And was contributed by Łukasz Tomczyk (Pedagogical University of Cracow, Kraków, Poland), Vladimir Costas Jáuregui (Universidad Mayor de San Simón, Cochabamba, Bolivia), Cibelle Albuquerque de La Higuera Amato (MacKenzie Presbyterian University, São Paulo, Brazil), Darwin Muñoz (Universidad Federico Henríquez y Carvajal (UFHEC), Santo Domingo, Dominican Republic), Magali Arteaga (Universidad del Azuay, Cuenca, Ecuador), Solomon Sunday Oyelere (University of Eastern Finland), Özgür Yaşar Akyar (Hacettepe University, Ankara, Turkey) and Mariana Porta (CENUR Noreste, UDELAR, Montevideo, Uruguay). The article compares issues related to attitudes towards the use of new media in education, experiences with different forms of e-learning, and the level of restrictions on the use of smartphones in school. On the basis of the pilot studies it was noted that: 1) Teachers from Latin American, Caribbean (LAC) and European (EU) countries like to use digital media; 2) Teachers note that new technologies are not always better than analogue didactic aids; 3) Teachers from the Dominican Republic, Brazil, Turkey, and Uruguay have much greater techno-optimism in themselves

than teachers from Bolivia, Poland, Finland and Turkey in terms of the impact of ICT on student motivation and engagement. In all countries teachers prefer free online courses (the different forms of e-learning are used most often by those in the Dominican Republic, and the least often in Bolivia and Poland). In each country teachers who highly value their own digital competences and have a positive attitude towards new media use ICT much more actively.

Learner behavior prediction in a learning management system. Is an article by Charles Lwande, Robert Oboko and Lawrence Muchemi (University of Nairobi, Kenya). They suggest that Learning Management Systems (LMS) lack automated intelligent components that analyse data and classify learners in terms of their respective characteristics. Manual methods involving administering questionnaires related to a specific learning style model and cognitive psychometric tests have been used to identify such behaviour, but the problem with this is that a learner can give inaccurate information and the manual method is also time-consuming and prone to error. Although literature reports complex models predicting learning styles, only a few have used machine learning methods such as an artificial neural network and so the primary objective of this study was to design, develop, and evaluate a model based on machine learning for predicting learner behaviour from LMS log records.

Adu Emmanuel Ifedayo, Azidah Abu Ziden and Aziah Binti Ismail (Universiti Sains Malaysia, Penang, Malaysia) next present: ***Mediating effect of behavioural intention on podcast acceptance.*** This research looks at university lecturers and used a cross sectional quantitative research design in which eight hundred and twenty-nine lecturers from three different south-west Nigeria Federal Universities participated. The result from descriptive analysis of data suggested that behavioural intention was at a low level among lecturers and the results of hypothesis testing revealed the effect of behavioural intention as partial mediator of podcast acceptance.

Many tertiary language courses have some online components as part of their blended learning initiatives points out Hiromi Muranaka-Vuletich (Western Sydney University, Australia) in the article: ***Effects of online language testing on final examination.*** These online activities could be part of assessments and online quizzes, or tests as preparation for the written examination and this article investigates the effects of online tests on final examination performance. The research involved examining results obtained from beginners' Japanese language students at a tertiary institute and used three-way comparisons of average scores and average number of attempts of online tests, with the final examination score. The results indicated that the number of attempts of quizzes cannot be used as an indicator of possible good final examination score, although the contents of quizzes and the final examination were closely related.

Effective measures to foster girls' interest in secondary computer science education A Literature Review. Comes from Lucia Happe (Karlsruhe Institute of Technology, Germany), Barbora Buhnova (Masaryk University, Brno, Czech Republic), Anne Koziolok (Karlsruhe Institute of Technology, Germany) and Ingo Wagner (Karlsruhe Institute of Technology, Germany). The authors point out that the interest of girls in computing drops early during primary and secondary education, with minimal recovery in later education stages, and this is becoming a major issue due

to the growing shortage of qualified computer science personnel. Numerous studies have examined measures, interventions, and strategies to boost girls' commitment to computing, but results are difficult to navigate, are rarely employed in classrooms. They summarise the existing body of knowledge on the effective interventions to recruit and retain girls in computer science education and to equip educators with a comprehensive and easy-to-navigate map of interventions recommended in the existing literature.

An overview of teacher training programs in educational robotics: characteristics, best practices and recommendations. Describes research by Despoina Schina, Vanessa Esteve-González and Mireia Usart (Department of Pedagogy, Applied Research Group in Education and Technology (ARGET), Universitat Rovira i Virgili, Tarragona, Spain). They argue that the emergence of Educational Robotics (ER) and its rapid spread across all levels of education in recent years has drawn attention to the need for further training in this discipline. They discuss the panorama of teacher training research in ER, making recommendations for institutions that intend to implement ER teacher training programs. They found a lack of uniformity regarding the duration and requirements of training programs and the fact that information on trainer and trainee profiles is not always documented. ER teacher training programs are often not founded on theory.

Visvaldas Legkauskas and Indrė Steponavičiūtė-Kupčinskė (Vytautas Magnus University, Lithuania) then present: **Links between in-class use of social media and school adjustment of high-school pupils.** Their study aimed to assess the links between in-class use of social media and academic and social school adjustment of 9th and 10th grade high school students in Lithuania. They used student questionnaires concerning their use of social media during class time and social adjustment at school, and the results indicated that more time spent using social networking sites during classes was linked to lower grade point average, more missed classes, and poorer relationships with peers.

The next article: **Hybridization of cluster-based LDA and ANN for student performance prediction and comments evaluation.** Is from Sakshi Sood and Munish Saini (Guru Nanak Dev University, Amritsar, Punjab, India). They suggest that education plays a critical role to fill individual life with value and excellence and is essential for individuals to partake in compete in the modern world. In their study, they used a hybrid approach consisting of Cluster-based Linear Discriminant Analysis (CLDA) and Artificial Neural Network (ANN) to provide the prospective students with the motivational comments and the video recommendations by which to choose the right subject.

Yehuda Peled (Western Galilee College, Akko, Israel) then presents: **Pre-service teacher's self-perception of digital literacy: The case of Israel.** The author says that teachers provide society with literacy needs and instruct students to acquire essential skills and competencies required for successful social integration creating a need to identify digital readiness in teachers. This study assessed the level of digital literacies and digital readiness of students majoring in education.

Understanding emergent teaching and learning practices: iPad integration in Polish school. By Lucyna Kopciewicz and Hussein Bougsiaa (University of Gdansk, Poland) notes that in the last few years school professionals in Poland have made

large investments in digitalisation, especially through one-to-one model (1:1), using digital devices such as tablets. But what they wonder really changes when digital technology is used in the classroom? Their research involved investigating teachers' practices and students' learning activities in a Polish primary school classroom, and how tablet technology is integrated into teaching and learning practices. The analysis resulted in three distinct maps of emergent teaching and learning practices and a series of conflicts and tensions teachers experience in their everyday tablet-mediated teaching practices. The findings point out that tablet technology integration needs the alignment of classroom-pedagogy-technology relationships.

The next study: ***Factors affecting the usage of learning management systems in higher education.*** Investigates use of learning management systems (LMSs) to analyse factors affecting usage behaviour and comes from Pongrapee Kaewsaiha and Sumalee Chanchalor (King Mongkut's University of Technology Thonburi, Bangkok, Thailand). The participants were students and teachers from various disciplines in higher education institutions in Thailand who used LMSs at different levels and included discontinued users. Data were analysed based on the technology acceptance model (TAM) and results indicated that perceived resource (within the information system concept), job relevance, and subjective norms were good predictors of LMS usage. The model revealed different perceptions between students and teachers to LMS usage.

TED talk comments to enhance critical thinking skills in an undergraduate reading and writing course. Is by Besma Allagui (Rabdan Academy, Abu Dhabi, United Arab Emirates) who remarks that commenting, liking, and reacting on the Internet have become ubiquitous and people have an opportunity to show their approval of comments. It has also become common to express several other feelings such as anger, love, and compassion through emojis. Critical thinking is an indispensable skill to teach to students today, but there is little research on how "liking" a comment can be used to promote critical thinking and deep learning. This article discusses the use of a simple guided critique of online comments to encourage students to think critically about what they are reading or viewing. The research involved students' written analyses of comments posted in response to a TED talk, students' pre-test and post-test critical thinking performance scores, and students' answers about the effectiveness of the analysis activity.

Elena Domínguez Romero (Universidad Complutense de Madrid, Spain) and Jelena Bobkina (Universidad Politécnica de Madrid, Spain) next offer: ***Exploring the perceived benefits and drawbacks of using multimodal learning objects in pre-service English teacher inverted instruction.*** This descriptive classroom-based study involved a group of pre-service teacher participants from the Masters' program in Teaching English as a Foreign and Second Language at the Complutense University in Madrid in Spain. The participants had three aspects: graduate students, classroom active debate leaders, and prospective teachers. The research aimed to explore what they perceived to be the benefits and drawbacks of using multimodal learning objects as learners, active classroom debate leaders and pre-service teachers of English in contexts of inverted classroom instruction.

Design, development and evaluation of open interactive learning objects for secondary school physical education. Is from Marina Papastergiou (University of

Thessaly, Greece) and Iakovos Mastrogiannis (Experimental High School of Mytilene of the University of the Aegean, Greece). Their study aimed to design and to develop a set of open, interactive digital Learning Objects (LOs) for high school Physical Education (PE), and to evaluate the newly-created LOs by PE teachers, experienced both in teaching PE and in ICT, as to their quality and usefulness, before the dissemination of the use of the LOs in schools. The evaluation consisted of a standard LO e-instrument comprising four criteria of quality (interactivity, design, engagement, usability), and of an additional item assessing the usefulness of the LO in the teaching of PE.

Situating ICT in early childhood teacher education. By Davoud Masoumi (University of Gävle, Sweden) points out that preparing the next generation of preschool teachers who can integrate and make use of ICT to capitalise on and develop young children's digital competences remains a challenging goal for teacher education programmes. The study reported in this paper aimed to expand and deepen understanding of the extent to which early childhood pre-service teachers encounter ICT during their training and how they are prepared to use digital technologies in their future practices. The findings suggest that pre-service teachers feel they have not been adequately prepared to integrate ICT into their future educational practices in preschool. Teacher educators, however, demonstrated a completely different perspective, highlighting a variety of initiatives that they were implementing to prepare the next generation of preschool teachers to use digital technologies.

Correction to: Problem-based gaming via an augmented reality mobile game and a printed game in foreign language education. By Juhee Lee (Gyeongsang National University, South Korea). In the original publication, some of the Table entries at the last column of Table 1 were mistakenly shifted to the 1st column during typesetting. The correct Table 1 is presented in this Erratum. The online version of the original article can be found at <https://doi.org/10.1007/s10639-020-10391-1>

The article to follow is from Kwaku Anhwere Barfi (University Library, University of Cape Coast, Cape Coast, Ghana), Brandford Bervell and Valentina Arkorful (College of Distance Education, Maths, Science & ICT, University of Cape Coast, Cape Coast, Ghana): **Integration of social media for smart pedagogy: initial perceptions of senior high school students in Ghana.** In the advanced world, the social platforms have provided affordances for integration in education providing smart learning environments, but within the Sub-Saharan African region, especially in Ghana, this phenomenon is emerging and warrants an investigation into the initial perceptions of students on integrating mobile phones and social media in the Ghanaian educational system, and this study investigates senior high school students' perception of the use of social media for pedagogical purposes. It makes use of Bandura's social learning theory and Vygotsky's social constructivism theory as its theoretical foundation. The study found that most of the students had positive perceptions towards the integration of social media and its effects on teaching and learning.

The next article, by Murat Debbağ (Bartın University, Turkey) and Sevilay Yıldız (Bolu Abant İzzet Baysal University, Turkey), investigates the effect of the Flipped Classroom (FC) model on the academic achievement and motivation levels of preservice teachers enrolled on a Teaching Principles and Methods (TPM) course, which is a higher education-level knowledge course in the teaching

profession. ***Effect of the flipped classroom model on academic achievement and motivation in teacher education.*** A quasi-experimental design was adopted for the study which used an experimental group with a TPM course based on an FC model, while no intervention was made in the control group. Based on the findings of the study, it was found that the academic achievement and motivation levels of the preservice teachers in the experimental group were significantly higher than those in the control group.

Ranking educational channels on YouTube: Aspects and issues. Is an article by Abdul Wadood Tadbier (University of Cambridge, UK) and Abdulhadi Shoufan (Khalifa University, Abu Dhabi, UAE). They note that YouTube has become a global platform for learning and teaching. Its design as a social medium, its rapidly growing content and the obscurity of its search and recommendation system, however, frequently leave users with suboptimal results. This study highlights some aspects and issues related to ranking YouTube's educational channels by a qualitative and quantitative analysis from websites. The results show that the aggregated ranked list of science channels has strong correlation with surface channel features, but the ranks of history channels are more correlated with viewers' positive ratings.

Nathanael S. Jost, Sina L. Jossen, Nicolas Rothen and Corinna S. Martarelli (Swiss Distance University Institute, Brig, Switzerland) write on: ***The advantage of distributed practice in a blended learning setting.*** This study aimed to investigate the role of learners' personalities and behaviours in their academic success in a blended learning setting. Next to individual differences in several variables (including intelligence), participants' learning time and learning motivation over one term was measured, using questionnaires for one learning module at the Swiss Distance University Institute. Data on the participants' grades at the end of the course and the number of exercises they completed during the term were obtained.

The next paper: ***Determining the barriers contributing to ICT implementation by using technology-organization-environment framework in Ethiopian higher educational institutions.*** Is from Amanuel Ayde Ergado (Jimma University, Ethiopia), Amare Desta (Queen Mary University of London, UK) and Hemini Mehta (London School of Economics and Political Sciences, UK). The authors used a case study and adapted the Technology-Organization-Environment (TOE) framework in its use. Participants were from higher learning institutions, ministry of science and higher education, higher education relevance and quality assurance agency, and non-governmental organisations. Their findings, using the TOE framework, indicated that technological, organisational, and environmental barriers are determining ICT implementation in the higher learning institutions of Ethiopia.

Open Educational Resources (OER) integrated online courses provide a rich and a flexible learning environment to acquire knowledge and skills among undergraduates say Thanuja Chandani Sandanayake, Shironica Priyanthi Karunanayaka and Ajith Parakum Madurapperuma (The Open University of Sri Lanka, Colombo, Sri Lanka) in their paper: ***A framework to design open educational resources-integrated online courses for undergraduate learning: A design-based research approach.*** They note that a significant issue with OER-integrated online courses is poorly addressed instructional design features and that instructionally rich online

courses have a greater impact on both teaching and learning. Their study aimed to explore different undergraduate learning process support systems through the design of OER-integrated online courses under four main Instructional Design aspects: Information Design, Instruction Design, Interface Design, and Interaction Design.

In the next paper: *Investigation of university students' behaviour in a Heterarchical twitter community*. Masami Yoshida (Chiba University, Japan) describes an investigational study of the formulation of the heterarchical online knowledge-based community among university students, which also involved users outside the course. In an exercise, students were assigned to post their opinions regarding global issues on Twitter to connect with social actors. These were collected by Twitter's application programming interface. Datasets were categorised into types of behaviour graphics, which were styles of online users' individual behaviour, as proposed by Solis. The results indicated a need to cultivate students' sociability skills and their pre-investigation of other communities to expand their knowledge-based community. The article discusses the importance of promoting a bridge to enhance connections with other communities.

Design and implementation of a SMART Learning environment for the Upskilling of Cybersecurity professionals in Mauritius. Comes from Roopesh Kevin Sungkur (University of Mauritius) and Manoj S. Maharaj (University of KwaZulu-Natal, Durban, South Africa). They argue that Teaching and Learning confined to within the four walls of a classroom or even online Learning through Massive Online Courses (MOOCs) and other Learning Content Management Systems (LCMS) are no longer seen as the optimal approach for competency and skills development, especially for working professionals who have their own training needs and prior knowledge. Adopting the one-size-fits all teaching approach is definitely not effective, motivating and encouraging. The described research presents the use of SMART Learning Environment that makes use of Intelligent Techniques to personalise the learning materials for each learner. A SMART Learning Environment making use of Artificial Neural Networks and Backpropagation Algorithm to personalise learning materials was eventually designed and implemented.

The next paper, by Özge Çevik (Ministry of National Education, Karaman, Turkey), Rıdvan ATA (Muğla Sıtkı Koçman University, Turkey) and Mustafa Çevik (Karamanoğlu Mehmetbey University, Turkey) examines the paths between excessive Internet use, school burnout and parental monitoring and their predictor effects in peer bullying and victimization among Turkish adolescents. *Bullying and victimization among Turkish adolescents: the predictive role of problematic internet use, school burnout and parental monitoring*. The study group consisted of students from each grade level from three different vocational high schools and used "Internet Addiction Scale", "School Burnout Scale", "Parental Monitoring Scale", and "Peer Bullying / Victimization Scale" as data collection instruments. Their findings were that the tendency of becoming a victim among vocational high school students is higher than becoming a bully. It was found that bullying and victimization were predicted by factors of problematic Internet use, school burnout, and parental monitoring and that there was a positive relationship between problematic Internet use and school burnout as well as parental monitoring and school burnout in line with the hypotheses.

The use of ICT in teaching religious education in primary school. Describes a study by Evangelia Karakostantaki and Kyriakos Stavrianos (University of Crete, Greece). Their purpose was to investigate students' understanding of Religious Instruction and more specifically the understanding of the Parable of the Prodigal Son, using a didactic approach with the aid of ICT. Two identical classes of pupils aged 6 to 7 attending the first grade of primary school in Heraklion, Crete were divided into two groups. The experimental group was taught through an intervention using ICTs as an auxiliary of teaching. The control group was taught according to the traditional instruction. The results showed significant improvement in the understanding of the Parable of the Prodigal Son in the experimental group in comparison to the control group.

Mohd. Elmagzoub Eltahir (Ajman University, United Arab Emirates), Najeh Rajeh Alsalmi (Ajman University, United Arab Emirates), Sami Al-Qatawneh (Ajman University, United Arab Emirates), Hatem Ahmad AlQudah (Al Ain University, Abu Dhabi, United Arab Emirates) and Mazan Jaradat (Ajman University, United Arab Emirates) then write on: ***The impact of game-based learning (GBL) on students' motivation, engagement and academic performance on an Arabic language grammar course in higher education.*** Their study was carried out utilising a case study with learners in two groups: one group that used the game-based classroom response system and the other which was instructed using non-game-based methods. The game-based online assessment tool Kahoot! was used as a formative assessment method in the lectures, and a questionnaire was designed to measure motivation and engagement.

Mobile devices in early childhood education: teachers' views on benefits and barriers. By Kleopatra Nikolopoulou (Kapodistrian University of Athens, Greece) begins by remarking that mobile devices (and especially tablets) have become increasingly popular in young children's lives. However, there is limited empirical evidence regarding early childhood teachers' perceptions on mobile technology-learning in early years. This study investigated teachers' views on mobile devices usage in early childhood education classrooms, focusing on their perceived benefits, barriers, and their concerns. The primary perceived benefits regarded the facilitation of the educational process, the interactive learning environment and the support of children's learning and development. Major perceived barriers were related to the lack of (or limited) resources and equipment, the limited teacher training opportunities and lack of funding, while key concerns regarded the constraint of hands-on experiences, children's concentration, and cyber safety issues. Implications for pre-service and in-service teacher training, educational policy and practice, as well as links between home and school are discussed.

Ali İbrahim Can Gözümlü (Kafkas University, Kars, Turkey) and Adalet Kandır (Gazi University, Ankara, Turkey) then present: ***Digital games pre-schoolers play: parental mediation and examination of educational content.*** The aim of their study was to examine mediations of parents who make digital games played by five to six year old children accessible, and the contents of the digital games played by children educationally. Qualitative data of the research consist of parents' opinions and the digital games their children play. It was established that children of parents using a

parental mediation consciously play digital games with educational content, but this rate is below 10%. It was determined that 90% of the parents do not use a mediation strategy consciously. Children who are not applied a mediation play digital games with violent and neutral content.

Flipped learning is considered an increasingly common strategy along with some drawbacks, but gamification has significant potential to deal with these says Murat Ekici (Usak University, Turkey) in: *A systematic review of the use of gamification in flipped learning*. Findings suggest that adding game elements into a flipped classroom yields higher motivation, participation and better learning performance, but that there is insufficient evidence to generalize the results. It is also found that Moodle and Kahoot are preferred platforms, and points, badges and leader boards are the most used game elements for gamification.

Technological factors of students' persistence in online courses in higher education: The moderating role of gender, age and prior online course experience. Relates a study by Sawsen Lakhal (Université de Sherbrooke, Quebec, Canada) and Hager Khechine (Université Laval, Quebec, Canada), the aim of which was to verify if technological factors have an influence on persistence in online courses. A theoretical model encompassing seven variables was tested, some of them borrowed from the Unified Theory of Acceptance and Use of Technology (UTAUT): performance expectancy, effort expectancy, social influence, facilitating conditions, attitude, anxiety and persistence in online courses and gender, age and prior online course experience were considered as moderating variables. Correlations revealed significant associations between persistence in online courses on the one hand and performance expectancy, effort expectancy, social influence, facilitating conditions, attitude, and anxiety on the other hand.

Cennet Göloğlu Demir (Bandırma Onyedi Eylül University, Turkey) and Nezih Önal (Nigde Ömer Halisdemir University, Turkey) next write on: *The effect of technology-assisted and project-based learning approaches on students' attitudes towards mathematics and their academic achievement*. The findings of the research suggest that the Technology-Assisted Learning (TAL) approach, when compared to the Project-Based Learning (PjBL) approach, had a higher level of effect on students' attitudes toward mathematics, but that the PjBL approach had a higher level of effect on academic achievement than did TAL.

Transparency in previous literature reviews about blended learning in higher education was contributed by Robin Castro-Gil (Universidad Icesi, Cali, Colombia) and Diego Correa (École Polytechnique de Montréal, Canada) who point out that literature reviews as standalone papers serve various purposes including the development of new theories, the shaping of future research, the production or knowledge dissemination, and support of evidence-based practices. Review papers, as a foundational block of the research process, may promote further research with higher level of quality, but in some cases, the methodological approach raises questions about their scientific rigor, trustworthiness, systematicity, and transparency. The main goal of this study was to assess transparency levels in previous review papers pertaining to blended learning in higher education.

Digital competences of residents in Kuyavian-Pomeranian Voivodeship in the light of the Polish training project "E-active". By Małgorzata

Kowalska-Chrzanowska and Przemysław Krysiński (Nicolaus Copernicus University, Toruń, Poland) and Marcin Paweł Karwowski (Rozwojownik”, Marcin Karwowski, Starogard Gdański, Poland) describes training implemented as part of the project “E-Active Residents of the Kuyavian-Pomeranian and Łódź Voivodeships” and to present the results of partial assessment of the level of digital competence of 75 training groups recruited from select municipalities. The project was implemented as part of the Digital Poland Operational Program for 2014–2020 by the Płużnica Commune Development Association in partnership with the Polish Ministry of Digital Affairs and the Foundation of Active Development Initiatives. Each training participant was obliged to take a pre-test consisting in ten single-choice questions, that verified digital competences (like use of search engines, digital resources, e-administration services, tools of cybersecurity). At the end of the training (consisting of the lecture with the presentation of tools) each had to solve the post-test to validate their knowledge. The obtained results show evidence of the high effectiveness of the trainings.

Life design is a postmodern paradigm in career interventions for which technology plays an important role in helping clients in a career decision-making process say Nooshin Pordelan (Islamic Azad University, Tehran, Iran), Simin Hosseini (Alzahra University, Tehran, Iran) and Abdollah Baei Lashaki (University of Padova, Italy) in their paper: ***Digital storytelling: a tool for life design career intervention***. Forty-five students in Tehran were randomly selected to participate in the labour market entrance course and were assigned to (a) digital storytelling, (b) face-to-face storytelling, and (c) control groups. Their findings showed that career decision-making and career decision-making self-efficacy of the subjects in the intervention groups increased relative to the control group and the group in which the digital storytelling was used for career interventions obtained higher career decision-making self-efficacy than other groups.

Self-regulated learning and satisfaction: A key determinants of MOOC success. Is by Nour Awni Albelbisi (University of Malaya, Kuala Lumpur, Malaysia), Ahmad Samed Al-Adwan (Al Ahliyya Amman University, Amman, Jordan) and Akhmad Habibi (Universitas Jambi, Indonesia). They note that MOOC is an innovative method in modern education, particularly important for sharing of excellent educational resources worldwide, but that to realize its full potential we need to understand the factors influencing MOOC success. This study proposed a theoretical framework integrating self-regulated learning theory and DeLone and McLean success model to investigate the determinants of successful MOOC. It examined the relationships between quality factors and satisfaction and self-regulated learning and understand the role of satisfaction as a mediator of the quality factors /self-regulated learning relationships.

Although some studies have explored massive open online courses (MOOCs) discussion forums and MOOC online reviews separately, studies of both aspects are insufficient says Bing Wu (Tongji University, Shanghai, China) in: ***Influence of MOOC learners discussion forum social interactions on online reviews of MOOC***. Based on the theory of self-determination, this paper proposes research hypotheses that MOOC learning progress has a direct impact on MOOC online reviews and an indirect influence on MOOC online reviews through social interactions in discussion forums. Coursera the largest MOOC platform, was selected as

the empirical research object, and data from learners who participated in the MOOC discussion forum and provided MOOC online reviews from August 2016 to December 2019 were obtained from the most popular course, “Machine Learning”. Results show that the length of MOOC online review text is affected by the MOOC learning progress, the number of discussion forum posts, the number of followers and the online review sentiment and MOOC rating.

Ekaterina Vladimirovna Kargapolova and Andrey Vadimovich Novikov (Plekhanov Russian University of Economics, Moscow, Russian Federation), Stanislav Viktorovich Kargapolov (Volgograd State University, Russian Federation), Andrey Petrovich Koshkin and Julia Aleksandrovna Davydova (Plekhanov Russian University of Economics, Moscow, Russian Federation) next present: ***E-culture of Russian students: Socio-cultural differentiation***. They suggest that electronic culture constitutes a new form of social adjustment in the digital era and the aim of their study was to reveal socio-cultural differentiation in the social group of Russian students whose e-culture is being shaped. To achieve their research aim they analysed the concept of “e-culture” focusing on its theoretical and methodological interpretations. Their paper provides an overview of current approaches to understanding electronic culture, namely competence and activity-based approaches, axiological and institutional ones. Cultural studies of classical sociology served as a theoretical and methodological basis for their applied research.

Healthcare data management conceptual framework for service delivery. By Tiko Iyamu and Khaya Nunu (Cape Peninsula University of Technology, South Africa) points out that huge amount of healthcare data exists in South Africa and that they are consciously and unconsciously scattered in bits and pieces across facilities within the country. This has directly or indirectly resulted to under-utilisation of data, which affects service delivery to the community and many patients have been wrongly diagnosed, and some others have been given wrong medications due to duplication of prescriptions, which were influenced by lack of real-time information. This study was undertaken on the premise of these challenges, to develop a conceptual framework that can guide how data could be managed towards improved services within the South African healthcare facilities.

The ethical dimension of digital competence in teacher training. By Carlos Novella-García and Alexis Cloquell-Lozano (Universidad Católica de Valencia San Vicente Mártir, Valencia, Spain) argues that communication technologies should be considered as a means available for people to pursue the objectives of supporting the development of equality, freedom, solidarity, and socialisation. They point out that Infant and Primary Education teachers play an important role in the acquisition of digital competences by their students, and their article asks to what extent the university degrees of Early Childhood and Primary Education Teachers in Spain, where students are trained in subjects related to the use and learning of ICT applied to Education and address digital competences from the ethical dimension. The research results indicated that, although digital competences were present in most of the assessed plans through a subject related to the learning and use of ICT in education, only 26% of the teaching guides incorporated the ethical dimension of this subject.

Currently, computer-based tests are widely used in large-scale assessments in education, point out Lucinda A Leria, Priscila Benitez and Francisco J Fraga (Federal

University of ABC, São Paulo, Brazil) in their article titled: *Assistive technology in large-scale assessments for students with visual impairments: A systematic review and recommendations based on the Brazilian reality*. The effective participation of people with visual impairments (PwVI) through use of Assistive Technologies (ATs) to take these tests equitably and independently, however, is an open challenge, particularly in countries with high social inequality, as Brazil. Their study systematically mapped the ATs used by PwVI to access digital information in large-scale assessments. Their systematic literature review pointed to a wide range of ATs to make tests accessible, as well as to a trend towards the implementation of global solutions through important partnerships and consortia. Such initiatives present proposals for accessible, reusable, and interoperable technology solutions that promote access to examinations based on the concept of universal design to guarantee the right to education for everyone, including PwVI.

In the last paper for this issue: *A new model for the factors that affect interactive whiteboard usage of teachers and its effect on performance*. Şule Betül Tosuntaş (Bursa Uludag University, Bursa, Turkey), Zühal Çubukçu (Eskisehir Osmangazi University, Eskisehir, Turkey) and Gary Beauchamp (Cardiff Metropolitan University, UK) investigated teachers' acceptance and use of interactive whiteboard (IWB), technological pedagogical content knowledge (TPACK), and transition to use of IWB effects on teacher performance. The study group consisted of teachers who worked in primary, secondary and high school in Turkey and data was collected via four scales: Acceptance and Use of IWB Scale, TPACK Practical Scale, IWB Transition Framework Scale, and Teacher Performance Scale. They found that TPACK has positive effects on acceptance and use of IWB and teacher performance, acceptance and use of IWB has positive effects on IWB transition, and teacher performance and IWB transition has a positive effect on teacher performance.

This issue, as usual, contains articles from many researchers around the world in the following countries: Australia, Austria, Bolivia, Brazil, Canada, China, Colombia, Czech Republic, Denmark, Dominican Republic, Ecuador, Ethiopia, Finland, France, Germany, Ghana, Greece, India, Indonesia, Iran, Israel, Japan, Jordan, Kenya, Lithuania, Malaysia, Mauritius, Oman, Poland, Russian Federation, Saudi Arabia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Thailand, Turkey, United Arab Emirates, United Kingdom and Uruguay.

Dedicated, professional reviewers are an essential part of any research journal and EAIT is fortunate to have some excellent reviewers. We do, however, have a problem. We do not have enough reviewers! In 2020 we had over 1300 submissions to the journal (288 articles were published), and in the *first three months* of 2021 we have received 650 submissions. This will mean a huge effort for our present number of dedicated and professional reviewers. We need more people to register as reviewers and we encourage readers to consider registering and inviting their colleagues also to register. To do this, go to the EAIT Editorial Manager (<https://www.editorialmanager.com/eait/default.aspx>) and click on Register Now.

Arthur Tatnall
Editor-in-Chief

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