



Editorial for EAIT Issue 6, 2018

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This final issue for 2018 of the journal of *Education and Information Technologies* (EAIT) is a bumper issue with forty articles from researchers in Iran, Italy, Chile, Turkey, Brunei Darussalam, Cyprus, Finland, Greece, Oman, Australia, Malaysia, India, Egypt, Saudi Arabia, Netherlands, Morocco, Jordan, Germany, Russia, Fiji, Indonesia, Denmark, UK, Canada, Ireland, Thailand, Israel, Crete, and Nigeria.

To begin this issue is “**The pedagogical agent enhances mathematics learning in ADHD students**” from Nasrin Mohammadhasani (Kharazmi University, Tehran, Iran), Hashem Fardanesh and Javad Hatami (Tarbiat Modares University, Tehran, Iran), Naser Mozayani (Iranian University of Science and Technology, Tehran, Iran) and Rosa Angela Fabio (Messina University, Italy). They note that gaining attention is the first key step to enhance learning and that in Attention-Deficit/Hyperactivity Disorder (ADHD) as the most prevalent deficit in school age and learners face some impairment in attention that requires appropriate intervention. They describe how an environment with an embedded Pedagogical Agent (Koosha) in computer-assisted instruction has been designed for these students to support learning through gaining and guiding attention to relevant information.

Following, Daniela D. Olivares and Rodrigo R. Castillo (Universidad de La Serena, Chile) write on: “**ICT in the classroom: Primary education student teachers’ perceptions of the interactive whiteboard during the teaching practicum**”. In this study, they examined and analysed evidence from teaching practica to assess the success of ICT – specifically the interactive whiteboard – as a teaching tool. They found a set of variables for good practice including: incorporating technology as an engaging didactic resource, making the most of technology for improving learning, determining when best to use the whiteboard, and identifying any limiting factors together with students’ suggestions for improvement.

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“Investigating the effects of peer instruction on preservice mathematics teachers’ achievements in statistics and probability” comes from Yusuf Ziya Olpak, Serdal Baltaci and Muhammet Arican (Ahi Evran University, Kirsehir, Turkey), who investigated the effects of two different accountability scoring mechanisms, which were used during the peer instruction process, on pre-service middle school mathematics teachers’ achievements in statistics and probability.

Next, Aqilah Nawwarah H.A. Rajak, Dk. Nurul Najiah Pg Abu Bakar, Nur Dina Azyyati Lajim, Nurul Hikmatull Su’aidah Haji Kamarulzaman, Siti Nur Fakhrinah Haji Karim and Mohammad Nabil Almunawar (Universiti Brunei Darussalam) investigate e-learning services acceptance in higher education institutions in Brunei Darussalam. **“E-learning services acceptance in higher educational institutes: A case study in Brunei”** looks at seven hypotheses, relating to independence (lecturer’s characteristics, design of learning contents, teaching materials and playfulness), intermediary (perceived benefits and perceived ease of use) and dependent variables (intention to use e-learning). Their analysis confirmed that the lecturer’s characteristics, teaching materials, perceived ease of use and the intention to use e-learning correspond to the perceived benefits.

Chrystalla G. Antoniou and Andri Ioannou (Cyprus University of Technology) then write on: **“Technology for Social Change in school contexts: A new landscape for K-12 educational technology research”** with a research focus on technology-enhanced social change in K-12 education that can positively impact society and help address larger societal problems. Their study summarised literature (2006–2017) where technology has been employed as a tool for achieving social change via working with K-12 school students.

The next article investigates computer-mediated communication in higher education by experimenting with a modern communication tool called Slack. **“Using Slack for computer-mediated communication to support higher education students’ peer interactions during Master’s thesis seminar”** is by Ari Tuhkala and Tommi Kärkkäinen (University of Jyväskylä, Finland) and looked at how Slack could provide this support.

The article that follows: **“Blended learning at pre-service teacher education in Turkey: A systematic review”** is by Abdullah Atmacasoy (Kocaeli University, Turkey) and Meral Aksu (Middle East Technical University, Turkey). They note that literature shows an increase in blended learning implementations at education faculties in Turkey, but that pre-service and in-service teachers’ ICT competencies have been identified as one of the areas where they are in need of professional development. Their review was conducted to find the impact of blended learning on academic achievement and attitudes at teacher education programs in Turkey.

“The effect of simulation games on learning computer programming: A comparative study on high school students’ learning performance by assessing computational problem-solving strategies” from Nikolaos Pellas and Spyridon Vosinakis (University of the Aegean, Greece) points out that computer games are quickly gaining momentum by enabling new approaches to teaching and learning experience for

programming courses in K-12 curriculum. Their quasi-experimental study presents evidence about how a game can assist boys and girls to gain a greater understanding of skills related to computational thinking for developing, implementing and transforming their solution plans into code based on their computational problem-solving strategies.

Next, Sohail Iqbal Malik (Buraimi University College, Oman) and Jo Coldwell-Neilson (Deakin University, Australia) discuss: **“Gender differences in an introductory programming course: New teaching approach, students’ learning outcomes, and perceptions”**. Their article reports on a study of gender differences in an introductory programming course that used a new teaching and learning approach based on the ADRI (Approach, Deployment, Result, Improvement) model. Their results showed that female students performed better in the high achiever category and male students performed better in the medium and low achiever categories in the final exam.

“The moderating effect of experience on the intention to adopt mobile social network sites for pedagogical purposes: An extension of the technology acceptance model” is an article by Lam Wai Leong and Othman Ibrahim (Universiti Teknologi Malaysia), Mohammad Dalvi-Esfahani and Hamed Shahbazi (University of Isfahan, Iran) and Mehrbakhsh Nilashi (Universiti Teknologi Malaysia) that explores the factors that determine and influence the adoption of mobile social network sites in facilitating learning. The main purpose of their study was to explore the determinants of students’ behavioural intention to do this by utilising an extended version of the Technology Acceptance Model (TAM).

Molecular symmetry plays a central role in chemistry education with regard to predicting chemical properties such as bonding and spectroscopic transitions, and Krishnashree Achuthan, Vysakh Kani Kolil and Shyam Diwakar (Amrita Vishwa Vidyapeetham, India) discuss this in: **“Using virtual laboratories in chemistry classrooms as interactive tools towards modifying alternate conceptions in molecular symmetry”**. Their article elaborates a methodology designed to discover the alternate conceptions stemming from teaching molecular symmetry in a typical classroom environment and the impact of the virtual laboratory environment in correcting these misconceptions.

This article investigates the effects of integration of online learning and assessment in synchronization form on students’ learning performance. **“Combining Online Learning & Assessment in synchronization form”** by Mohamed A. Amasha and Rania A. Abougala (Damietta University, Egypt), Ahmad J. Reeves and Salem Alkhalaf (Qassim University, Saudi Arabia) seeks to evaluate how the synchronization content with immediate assessment can affect the knowledge performance of the students, finding that this was an intrinsic motivation and could be a promising way of enhancing students’ learning performance.

“Exploring the potentials of educational robotics in the development of computational thinking: A summary of current research and practical proposal for future work” was contributed by Andri Ioannou and Eria Makridou (Cyprus University of Technology). There is an argument that computational thinking will be a

fundamental skill needed for all individuals by the middle of the twenty-first century and thus should be cultivated in the early school years as part of the child's analytical thinking and as a principal component of Science-Technology-Engineering-Mathematics (STEM) education. Educational robotics is a useful supporting tool for this purpose.

Andreas Alexiou (University of Amsterdam, the Netherlands) and Michaéla C. Schippers (Erasmus University, the Netherlands) write on “**Digital game elements, user experience and learning: A conceptual framework**”. The aim of this paper was to identify and theoretically validate the relationships between core game design elements and mechanics, user motivation and engagement and consequently learning, as well as to highlight the moderating role of player personality traits on learning outcomes and acceptance and suggest ways to incorporate them in the game design process.

The next article describes research aimed to investigate medical students' evaluation of using Telegram as a Social Networking Site in English for Specific Academic Purposes programs. “**Evaluating the educational usability of Telegram as an SNS in ESAP programs from medical students' perspective**” was contributed by Iman Alizadeh (Guilan University of Medical Sciences, Iran). Findings indicated that the trend of the students' views about the merits of the site centred on technical categories, their views about the demerits of the system revolved mainly around behavioural categories and their propositions were closely linked to educational categories.

“**Effect of blended learning and learners' characteristics on students' competence: An empirical evidence in learning oriental music**” by Chamila Nishanthi Edward (Management and Science University, Malaysia), David Asirvatham (Taylor's University, Malaysia) and Md. Gapar Md. Johar (Management and Science University, Malaysia) note that blended learning has emerged as the most popular instructional design strategy in education in the last decade as it can significantly elevate students' engagement and competency in the learning process. Many countries, such as Sri Lanka, are still lag behind adopting this instructional design and this study aimed to investigate the effect of blended learning and learners' characteristics on Sri Lankan students' competence and to investigate the effectiveness of blended learning in teaching Oriental Music.

Fatima Ezzahraa Louhab, Ayoub Bahnasse and Mohamed Talea (University Hassan II of Casablanca, Morocco) next look at mobile learning and the flipped classroom approaches. “**Considering mobile device constraints and context-awareness in adaptive mobile learning for flipped classroom**” considers the usefulness of the context-aware mobile learning systems that take into account the different context dimensions to offer learners adapted learning according to their situation. Evaluation results showed that the use of the context dimensions and the device context in adaptive mobile learning is more beneficial for learners, especially in the flipped classroom.

“**Perceptions toward adopting virtual reality as a teaching aid in information technology**” is from Salsabeel F. M. Alfalah (The University of Jordan). The use of technological tools is increasing rapidly in all fields of education, but it remains

challenging to provide sufficient learning media to higher education students. Virtual Reality is considered one of the novel options to add value to learning as it enables students to discover and explore their own knowledge and makes the learning process more interesting, so improving students' motivation and attention.

Nooshin Pordelan, Ahmad Sadeghi, Mohammad Reza Abedi, Marjan Kaedi (University of Isfahan, Iran) next write on: **“How online career counselling changes career development: A life design paradigm”**. This study aimed to investigate and describe the role and effect of online career counselling interventions on the career development of students. Their results showed that interventions increased the students' level of career knowledge.

The next article: **“Introducing fundamental object-oriented programming concepts in preschool education within the context of physical science courses”** comes from Kalliopi Kanaki and Michail Kalogiannakis (University of Crete) and begins by reminding us that objects are everywhere and that people deal with them all their lives. Although the basis of object-oriented programming is translating real-world objects into object-oriented code, learning object-oriented programming is still a difficult task. Their article presents a research proposal on how fundamental object-oriented programming concepts could be introduced to children in early childhood education when physical science courses take place.

Many researchers conduct studies in order to ensure technology integration in education, but most are related to material design and Serkan Dinçer (Çukurova University, Turkey) writes on: **“Are preservice teachers really literate enough to integrate technology in their classroom practice? Determining the technology literacy level of preservice teachers”**. The purpose of the reported study was to determine knowledge, skills and attitudes about technology use by preservice teachers. Results found no relationship between knowledge/skill test scores and attitude as preservice teachers could not correctly describe their level of technology literacy, meaning that courses about technology literacy must be given in teacher training.

“Adult content filtering: Restricting minor audience from accessing inappropriate internet content” is by Bhavish Khanna Narayanan, Rajasekhara Babu M, Sharon Moses J and Nirmala M (VIT University, India). Smartphones have given minors unprecedented access to the internet and this poses the risk of unwanted exposure as well as intended access to harmful internet content such as pornography, violence and unmoderated chat sites which can have profound effects on the life of the minors. A strategy is proposed to address this concern.

A parsing algorithm visualizer is a tool that visualizes the construction of a parser for a given context-free grammar and then illustrates the use of that parser to parse a given string. These are used to teach a course on compiler construction which is included in all the authors' undergraduate computer science curricula. **“PAVT: a tool to visualize and teach parsing algorithms”**, coming from Somya Sangal, Shreya Kataria and Twishi Tyagi (Netaji Subhas Institute of Technology, India), Nidhi Gupta (Hansraj College, India), Yukti Kirtani, Shivli Agrawal and Pinaki Chakraborty (Netaji Subhas

Institute of Technology, India), presents a new parsing algorithm visualizer that can visualize six parsing algorithms: predictive parsing, simple LR parsing, canonical LR parsing, look-ahead LR parsing, Earley parsing and CYK parsing.

A. Zendler and K. Klein (Pädagogische Hochschule Ludwigsburg, Germany) present a study which focuses on the empirical examination of learning outcome with respect to two instructional methods: direct instruction and web quest: “**The effect of direct instruction and web quest on learning outcome in computer science education**”. Their findings show that learning with direct instruction performs better than web quest.

“**Big data for online learning systems**”. In recent times online learning systems have seen rapid changes in technology, gigantic amounts of data to be stored and manipulated, a large number of learners, and diversity of educational resources. Karim Dahdouh, Ahmed Dakkak, Lahcen Oughdir and Fayçal Messaoudi (Sidi Mohamed Ben Abdellah University, Morocco) suggest that e-learning platforms must change their mechanisms for data processing and storage to be smarter. This article introduces the big data concept and its characteristics, and focuses on integration in a computing environment for human learning dedicated to online learning systems.

The next article examines applying interactive teaching methods at Russian universities. “**Interactive methods of teaching at Russian engineering universities**” by Veniamin Aleksandrovich Norin, Natalia Vladimirovna Norina and Yurii Vladimirovich Pukharenko (Saint Petersburg State University of Architecture and Civil Engineering, Russia) looks at interaction between professors and students that have become common at Russian universities: passive teaching methods, active teaching methods, and interactive teaching methods.

Kleopatra Nikolopoulou and Vasilis Gialamas (University of Athens, Greece) then write on: “**Mobile phone dependence: Secondary school pupils’ attitudes**”. Their article is a study into investigation of secondary school pupils’ attitudes regarding possible mobile phone dependence. In their research they found that around half of the selected sample reported perceptions linked to the social motivational aspect of the mobile phones (peer dependence), phone use in order to feel better, as well as some negative consequences (loss of control).

“**What’s your status? Investigating the effects of social media on the students of Fiji National University**” describes research by Akash Dutt Dubey (Jaipuria Institute of Management, India), Mumtaz Alam (Fiji National University) and Rani Roop Rekha (Lami High School, Fiji). This research work concentrates on the students of the Fiji National University and scrutinizes the effects of social media and networking sites on their behaviour as well as their education. It found that Fiji students have been affected both in positive and negative manners by the social media and social networking sites.

The next paper: “**Short answer scoring system using automatic reference answer generation and geometric average normalized-longest common subsequence (GAN-LCS)**” comes from Feddy Setio Pribadi (Universitas Gadjah Mada, and

Universitas Negeri Semarang, Indonesia), Adhitya Erna Permanasari (Universitas Gadjah Mada, Indonesia) and Teguh Bharata Adji (Universitas Gadjah Mada, Indonesia). They note that Automatic Short Answer Scoring system is one of the tools that can be used to conduct assessment process on e-learning systems. One of the methods applied in this system is for measuring similarities between the reference and student answers.

Eeva Liikanen (Tampere University of Applied Sciences, Finland), Marko Björn (Turku University of Applied Sciences, Finland) and Marianne Nielsen (University College Absalon, Denmark) then describe how seventeen degree programmes of Biomedical Laboratory Science in all Nordic countries collaborate in BioNord under NordPlus. The purpose of their study: **“Use of information and communications technology by teachers and students in biomedical laboratory science educations in the Nordic countries”** was to explore the use of ICT among teachers and students within the biomedical laboratory science studies in the Nordic countries collaborating in the NordPlus program.

“Evaluating the effectiveness of an educational programming intervention on children’s mathematics skills, spatial awareness and working memory” by David Messer (The Open University, UK), Lucy Thomas and Andrew Holliman (University of Coventry, UK) and Natalia Kucirkova (University College London, UK) investigates two questions. Firstly, is simple educational programming with children compared to working on mathematical tasks more effective in increasing scores in mathematical abilities, spatial awareness and working memory? Secondly is educational programming on a digital device, compared to similar paper and pencil programming activities, more effective in increasing mathematical abilities, spatial awareness and working memory?

The paper which follows is from Paul Bazelaïs and Tenzin Doleck (McGill University, Canada) and addresses the value of blended learning. **“Blended learning and traditional learning: A comparative study of college mechanics courses”** notes that research has suggested that learning approaches such as blended learning can enhance both the quality of instruction and student learning outcomes in STEM education. Little, however, is known about how such instructional approaches affect learning outcomes in the context of pre-university science students.

“Does more internet usage provide good academic grades?” by V. Senthil (Thiagarajar School of Management, India) notes that the Internet is an important resource for students’ academic activities and now occupies a central role in any academic environment. Student’s academic references have changed dramatically in recent years with students spending more time on the internet. Reading and reference style has changed drastically from traditional methods. The research found that internet usage has a marginal impact on students’ academic performance.

Since the early stages of schooling, many children are exposed to different learning disabilities, usually manifesting as dyslexia, dysgraphia, and dyscalculia. **“Developing effective educative games for Arabic children primarily dyslexics”**, coming from

Anoual El Kah and Abdelhak Lakhouaja (Mohammed First University, Morocco), notes that these disabilities impact on the normal academic achievement of the children and may even affect their social life. Their work offers a set of games for children with dyslexia and dysgraphia which delicately target Arabic learning disabilities and lend a helping hand to the child with LD to overcome reading and writing complications.

“The use of an online student response system to support learning of Physiology during lectures to medical students” is offered by Mohammed H. Abdulla (University College Cork, Ireland). This study aimed to validate the utilisation of online-based exercises for teaching medical students using Socrative, a free online platform, in teaching a physiology component of a second year module. Findings were that the use of online-based exercises through Socrative was positively received by medical students as an interactive classroom activity that also enhanced performance.

“Examining the motivation level of students in e-learning in higher education institution in Thailand: A case study” is from Si Na Kew (Universiti Teknologi Malaysia), Sirirat Petsangsri and Thanin Ratanaolam (King Mongkut’s Institute of Technology, Thailand) and Zaidatun Tasir (Universiti Teknologi Malaysia). E-learning in higher education institutions has the purpose of enhancing students’ performance in their learning practice and so motivation is one of the important predictors of intention to use e-learning that can in turn make an impact on students’ learning practice.

Zohre Mohamadi Zenouzagh (Islamic Azad University, Iran) next writes on: **“Multidimensional analysis of efficacy of multimedia learning in development and sustained development of textuality in EFL writing performances”**. The research investigated the effect of multimedia learning on textuality of Iranian English as Foreign Language intermediate learners’ writing performance in individual, collaborative and e-collaborative writing modalities from student and teacher perspectives.

“Intergenerational gaps in digital understanding and skills in Palestinian society in Israel” by Khaled Abu-Asbah (Al-Qasemi Academic College of Education, Israel) dealt with this, and its influence on relations between parents and their children. Findings indicate the existence of such gaps and differences in adults and children’s self-perception of their technological capabilities. This gap causes intergenerational tension harming the parents’ authority and consequently stimulating parents’ attempts to supervise the children’s use of the Internet.

There are many decision-making theories that explain how people decide to buy, click, read or skip something online. **“Students as information consumers: A focus on online decision making process”**, contributed by Emine Sendurur (Ondokuz Mayıs University, Turkey), notes that studies integrating the eye tracking methodology with decision-making processes have many assumptions. This study aimed to compare two search contexts to find if the assumptions are valid for both situations. Students were given two scenarios: a hotel search, and an academic topic search. They were assigned to decide on the best three options. As they engaged in searching, their eye movements accompanied with think-aloud were recorded.

The last paper of this issue: “**Constraints to the use of online platform for teaching and learning technical education in developing countries**” comes from Ifeanyi Benedict Ohanu and Chiamaka Adaobi Chukwuone (University of Nigeria). It examines why Technical Education teachers (including Instructors and Lecturers) in Nigeria are unwilling to use a recently provided online platform. The findings suggested that the inhibition rate of societal challenges is greater for Technical Instructors and for women than for Lecturers and men. Personality and attitudinal challenges have more inhibiting effect for Technical Instructors as well as senior Academics.

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