

The logo for the International Journal of Education and Development using Information and Communication Technology (IJEDICT) is displayed in a stylized, handwritten font.

**International Journal of Education and Development
using Information and Communication Technology**

Volume 13, Issue 1

April 2017

**Integrating ICT in Teaching and Learning:
Practices and Challenges**

Chief Editors:

Stewart Marshall and Wal Taylor

The University of the West Indies, Barbados, West Indies

IJEDICT Sponsoring Organizations:

The University of the West Indies Open Campus, West Indies

Published online by:

The University of the West Indies Open Campus, West Indies

IJEDICT url: <http://ijedict.dec.uwi.edu>

ISSN: 1814-0556

Editorial Team

Chief Editors:

Stewart Marshall, The University of the West Indies, Barbados;
Wal Taylor, The University of the West Indies, Barbados.

Book/Media Reviews Editor:

Ed Brandon, The University of the West Indies, Barbados.

Editorial Board:

George Bopi, AusAid (Consultant)
Tony Carr, University of Cape Town, South Africa
Lawrence Carrington, University of Guyana
Laura Czerniewicz, University of Cape Town, South Africa
Patrick Danaher, University of Southern Queensland, Australia
Sir John Daniel, Council for Higher Education Accreditation, USA
Peter Day, University of Brighton, UK
John Dekkers, Central Queensland University, Australia
E. Nigel Harris, The University of the West Indies, Jamaica, West Indies
David Jones, Central Queensland University, Australia
Wanjira Kinuthia, Georgia State University, USA
Cisco Magagula, University of Swaziland, Swaziland
Hilary Perraton, Von Hugel Institute, St Edmund's College, University of Cambridge, UK
Ravinder Rena, University of the Western Cape, Cape town, South Africa
Val Samonis, Institute for New Economic Thinking, NYC, USA and Royal Roads University, Canada
Greg Shaw, Charles Darwin University, Australia
Xinghuo Yu, Royal Melbourne Institute of Technology University, Melbourne, Australia.

Review Board:

Imoro Braimah, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana
Elly Broos, Netherlands Defence Academy, The Netherlands
Swee Heng Chan, Universiti Pertanian Malaysia
Ugur Demiray, Anadolu University, Turkey
Suely Fragoso, Universidade Federal do Rio Grande do Sul, Brazil
Robyn Henderson, University of Southern Queensland, Australia
Kathy Jackson, The Pennsylvania State
Sarah Jones, BERA, ALT, AACE, CP Squared (United Kingdom)
Michail Kalogiannakis, University of Crete (Greece)
Dr. Kinshuk, Athabasca University, Canada
Valerie Lopes, Seneca College of Applied Arts and Technology, Toronto, Canada
Ann MacCann, retired from Centre for Learning Innovation, NSW, Australia
Machdel Matthee, Machdel Catharina Matthee, University of Pretoria, South Africa
Jim Millar, Retired academic
Johnnie Muwanga-Zake, Uganda Martyrs University, Kampala, Uganda
Barry Natusch, Nihon University, Tokyo, Japan
Julius Nganji, University of Hull, UK
Edwin Oloo, Ministry of Education, Nairobi, Kenya
Krassie Petrova, Auckland University of Technology, New Zealand
Robert Petrusis, EPRE Consulting LLC
Fernando Ramos, University of Aveiro, Portugal
Camilius Sanga, Sokoine University of Agriculture, Tanzania
Michael Sankey, University of Southern Queensland, Australia.
Kok Eng Tan, Universiti Sains Malaysia
John Thompson, Buffalo State College, USA
Xiuwen Wu, National-Louis University, USA

Peer Review Panel:

Zohreh Abedi Kargiban, Ministry of Education in Iran;
Blessing Foluso Adeoye, University of Lagos, Akoka, Nigeria;
Ebenezer Afarikumah, Accra Institute of Technology, Ghana/Open University Malaysia;
Muhammad Tanveer Afzal, Allama Iqbal Open University, Islamabad, Pakistan;
Majid Al-Khataybeh, Mutah University, Jordan;
Margarida Almeida, University of Aveiro, Portugal;
Muriyankulangara Ananthakrishnan, Indian Institute of Technology, Mumbai, India;
C Annamalai, SEAMEO RECSAM, Penang, Malaysia;
Aslam Ansari, G B Pant University of Ag. & Tech. Uttaranchal, India;
Raman Arumugam, University Utara Malaysia;
Thomas Assan, North West University, South Africa;
Crispen Bhukuvhani, Bindura University of Science Education, Zimbabwe;
Sutapa Bose, IGNOU, India;
Russell Butson, Higher Education Development Centre, Otago University, New Zealand;
Las Johansen Caluza, Leyte Normal University, Philippines;
Yong Chen, Old Dominion University, USA;
Ngoni Chipere, The University of the West Indies, Barbados;
John Clayton, Waikato Institute of Technology, New Zealand;
Robert Corderoy, University of Wollongong, NSW, Australia;
Eduardo Correia, Christchurch Polytechnic Institute of Technology, New Zealand;
Reza Dashtestani, University of Tehran, Iran;
J. Tim Denny, UNESCO Bangkok, Thailand;
Crispen Dirwai, University of Zimbabwe, Zimbabwe;
Gülsün Eby, Anadolu University, Turkey;
Fatma Ekici, Pamukkale University, Turkey;
Thato Foko, CSIR Meraka Institute, South Africa;
Bob Fox, University of Hong Kong, Hong Kong, SAR, China;
Gerald Goh, Faculty of Business, Multimedia University, Malaysia;
Malliga Govindasamy, Teacher Education Institute, Johor Bahru, Malaysia;
John Griffin, Consultant, Oklahoma, USA;
Emerson Jackson, University of Birmingham, UK;
Rozinah Jamaludin, Universiti Sains Malaysia, Malaysia;
Haijun Kang, Kansas State University, USA;
Dr. Kinshuk, Athabasca University, Canada;
Ah Choo Koo, Multimedia University, Malaysia;
Kerwin Livingstone, University of Guyana, Guyana;
Maria Cristina Paniago Lopes, Universidade Católica Dom Bosco, Brazil;
Tian Luo, Ohio University, USA;
Florence Martin, University of North Carolina at Wilmington, USA;
David Mathew, University of Bedfordshire, UK;
Veronica McGowan, Computing Teachers SIG, International Society of Technology in Education;
Ton Mooij, Radboud Universiteit Nijmegen, The Netherlands;
Salomé Morais, Polytechnic Institute of Viseu, Portugal;
Sourav Mukhopadhyay, University of Botswana;
Balakrishnan Muniandy, Universiti Sains Malaysia;
Tokunbo Ojo, York University, Toronto, Canada;
Nwachukwu Ololube, University of Helsinki, Finland;
Sarah Pouezevara, RTI International, USA;
Puthira Prathap, Sugarcane Breeding Institute, Indian Council of Agricultural Research, India;
Mike Pregot, Long Island University, USA;
Sameerchand Pudaruth, University of Mauritius;
Juliana Raffaghelli, Institute of Educational Technologies, National Research Council, Italy;
T Ramayah, Universiti Sains Malaysia, Malaysia;
Ajakykumar Raut, Indian Council of Agricultural Research, Haryana, India;

Jayson Richardson, University of Kentucky, USA;
Kiyimet Selvi, Anadolu University, Turkey;
Zaffar Ahmed Shaikh, Institute of Business Administration, Karachi, Pakistan;
Ramesh Sharma, Indira Gandhi National Open University (IGNOU), India;
Gajendra Singh, Sikkim Manipal University Ghana, Accra, Ghana;
Parul Sood, Chitkara College of Education for Women, Rajpura, India;
Arulchelvan Sriram, Anna University, Chennai, India;
Vance Stevens, Petroleum Institute Abu Dhabi, UAE;
Troy Thomas, University of Guyana, Guyana;
Wei Keong Too, The University of Nottingham Malaysia Campus, Malaysia;
Sudhir Warier, Reliance Communications Limited, Mumbai, India;
Mingli Xiao, The University of Toledo, USA;
Saadiah Yahya, Universiti Teknologi MARA, Malaysia;
Yume Yamaguchi, Japan;
Pär-Ola Zander, Aalborg University, Denmark;
Nicholas Zezekwa, Bindura University of Science Education, Zimbabwe;
Inga Žilinskienė, Mykolas Romeris University, Lithuania;

Copyeditor:

Stewart Marshall, The University of the West Indies, Barbados, West Indies;

Layout Editor and Proofreader:

Stewart Marshall, The University of the West Indies, Barbados, West Indies

Technical Support:

Reeve Ramharry, The University of the West Indies, Trinidad & Tobago, West Indies.

Open Access Policy

This journal provides open access to all of its content on the principle that making research freely available to the public supports a greater global exchange of knowledge. Such access is associated with increased readership and increased citation of an author's work. For more information on this approach, see the Public Knowledge Project, which has designed this system to improve the scholarly and public quality of research.

Archiving

This journal utilizes the LOCKSS system to create a distributed archiving system among participating libraries and permits those libraries to create permanent archives of the journal for purposes of preservation and restoration.

Publication Frequency

There will be five issues of IJEDICT per year, in a continuous publication cycle. Articles will be published immediately in the current issue of IJEDICT on completion of the review/editing process.

Publication Classification Details

Key title: International journal of education and development using information and communication technology

Abbreviated key title: Int. j. educ. dev. using inf. commun. technol.

ISSN: 1814-0556

About the journal

The International Journal of Education and Development using Information and Communication Technology (IJEDICT) is an e-journal that provides free and open access to all of its content. It aims to strengthen links between research and practice in ICT in education and development in hitherto less developed parts of the world, e.g., developing countries (especially small states), and rural and remote regions of developed countries. The emphasis is on providing a space for researchers, practitioners and theoreticians to jointly explore ideas using an eclectic mix of research methods and disciplines. It brings together research, action research and case studies in order to assist in the transfer of best practice, the development of policy and the creation of theory. Thus, IJEDICT is of interest to a wide-ranging audience of researchers, policy-makers, practitioners, government officers and other professionals involved in education for development in communities throughout the world.

Coverage

IJEDICT has a major emphasis on the use of ICT in education and development in hitherto less developed parts of the world. The journal includes descriptive case studies about education projects in developing countries and in rural and remote regions of developed countries, as well research articles evaluating such projects, developing policy or creating theory. Topics covered include, but are not limited to, the following areas: Distance learning, e-learning, flexible learning and delivery, blended learning, open learning, e-literacy, e-portfolios, MOOCS.

Notification of new articles

Sign up to receive regular notification of new IJEDICT issues and articles at:
<http://ijedict.dec.uwi.edu/notification.php>

Call for Papers/Articles

IJEDICT comprises the following sections: "research articles" (academic, peer-reviewed articles); "studies from the field" (edited but not peer reviewed case studies); "research in progress"; "literature reviews"; "project sheets" (brief descriptions of relevant projects); "notes from the field" (working papers, and other commentaries on relevant topics); "book/media review" (software and other media reviews).

The Editors welcome submissions at: <http://ijedict.dec.uwi.edu/submissions.php>

Section Policies

Editorial

This section contains the editorial written by the editors for the specific issue.

Refereed Articles

This section contains articles that have been reviewed by at least two academic peers in a process that ensures that authors and reviewers remain unknown to one another. To be included in this section, articles must be based on research and scholarship, and contribute "new" and significant knowledge to the field of ICT for education and/or development. Reviewers for research articles are selected from the Editorial Board, the Review Board and the Peer Review Panel.

From the Field

This section includes peer-commented and editorially reviewed case studies (2000-5000 words) of the use of ICT in education and/or development.

Invited Articles

As the name suggests, "Invited Articles" are ones specially requested by the Editors. Generally, they are editorially reviewed.

Research in Progress

This section includes peer-commented and editorially reviewed articles describing research in progress.

Literature Reviews

This section includes peer-commented and editorially reviewed articles that review the literature of the use of ICT in education and/or development.

Project Sheets

This section includes brief descriptions (500-1000 words) of education and development projects that utilise ICT.

Notes from the Field

This section contains short comments or notes that are useful for practitioners working in the field of ICT in education and/or development.

Book/Media Reviews

This section contains editorially reviewed reviews of books that are relevant to the use of ICT in education and/or development.

Submission of Articles

Authors can upload papers, as well as data sets, research instruments, and source documents through the journal's Submissions section. Papers, figures, and appendices can be submitted in a variety of file formats, including Microsoft Word and RTF (Rich Text Format).

Registration and login are required to submit items online and to check their status.

Author Guidelines

General Information

- Submissions are invited for all sections of this journal. Refereed articles should be between 3,500 and 6000 words in length. Project descriptions for the "Project Sheets" section should be between 500-1000 words in length. Submissions for other sections of the journal can be any length.
- Submissions can be in Microsoft Word, Rich Text Format (RTF), or equivalent Open Source document file format.
- Please use Arial 12-point font for the Title, which should be in bold "title" (upper and lower) case.
- Use Arial 10-point font for the remainder of your article.
- First level headings should be in bold uppercase.
- Second level headings should be in bold "title" (upper and lower) case.
- No footnotes please - instead use endnotes.
- Photographs, maps, diagrams and other audio-visual aids are encouraged. Please include these in the text where and as they should appear. Please provide images in gif or jpeg formats.
- Note that all submissions are checked for originality using Turnitin before being sent out for review.

Abstracts

Please provide an abstract of approximately 100 words. The abstract should be included with the rest of your article in the submission file, but it should also be copied into the appropriate text box during the on-line submission process.

Biography

Please supply a short (100 word) biography for each author. This should include the name, rank, institution, institutional address, and email address. Do not place the biography in your submission file but copy it into the appropriate text box during the on-line submission process.

Style

Submitted manuscripts must be written in the Harvard editorial style:

- References should relate only to material cited within the manuscript and be listed in alphabetical order, including the author's name, complete title of the cited work, title of the source, volume, issue, year of publication, and pages cited. See the following examples:
 - Marshall, S. (1991), "A genre-based approach to the teaching of report-writing". *English for Specific Purposes*, vol. 10, no.1, pp. 3-13.
 - Taylor, W. & Marshall, S. (2002), "Collaboration: the Key to Establishing Community Networks in Regional Australia", *Informing Science*, vol. 5, pp. 155-162.
 - Marshall, S., Taylor, W., & Yu, X. (eds.) (2003), *Closing the Digital Divide: Transforming Regional Economies and Communities with Information Technology*, Greenwood Publishing, Westport CT.
- Citations in the text should include the author's name and year of publication where you use the source in the text, as in the following examples:
 - In this way, information technology can be seen to effect and influence changes in organisational structure (Orlikowski & Robey 1991).
 - Edwards (1995, p.250) views the globalising of distance education as "invested with the uniform cultural messages of modernity".
 - Globalisation, especially in relation to open and distance education, will reduce the tolerance of difference and so "how can local issues and contexts be addressed?" (Evans 1995, p.314).
- Further information about the Harvard editorial style can be found at:
<http://www.lmu.ac.uk/lskills/open/sfl/content/harvard/index.html>

Copyright Notice

Copyright for articles published in this journal is retained by the authors, with first publication rights granted to the journal. By virtue of their appearance in this open access journal, articles are free to use, with proper attribution, in educational and other non-commercial settings.

Privacy Statement

The names and email addresses entered in this journal site will be used exclusively for the stated purposes of this journal and will not be made available for any other purpose or to any other party.

Principal Contact and Mailing Address

Professor Stewart Marshall
Managing Editor, IJEDICT
The University of the West Indies Open Campus
Cavehill, Bridgetown, BARBADOS, West Indies
Email: stewart.marshall@open.uwi.edu

Table of Contents

editorial

- Editorial: Integrating ICT in Teaching and Learning: Practices and Challenges 2
Stewart Marshall and Wal Taylor

refereed articles

- Computer-assisted instruction: 'JClic' as a new pedagogical tool for EFL learners 4
Sorina Stelea and Carolina Girón-García
- The challenges facing the integration of ICT in teaching in Saudi secondary schools 32
Aishah Alkahtani
- Pre-service teachers' attitude towards information and communication technology usage: A Ghanaian survey 52
Stephen Adu Gyamfi
- Malaria prevention and treatment using educational animations: A case study in Kakamega County, Kenya 58
Julia Bello-Bravo, Anne Namatsi Lutomia, Lawrence Mbhekiseni Madela and Barry Robert Pittendrigh
- Using electronic textbooks to teach mathematics in the secondary classroom: What do the students say? 87
Bruce Allen Knight, Maria Casey and John Dekkers
- Practices and challenges in an emerging m-learning environment 103
Edgar Napoleon Asimwe, Åke Grönlund and Mathias Hatakka
- Explaining Electronic Learning Management Systems (ELMS) continued usage intentions among facilitators in Higher Education Institutions (HEIs) in Tanzania 123
Bruckse Muries and Juma James Masele
- Integrating Information and Communication Technology in English Language teaching: A case study of selected Junior Secondary Schools in Botswana 142
Mbizo Mafuraga and Mbiganyi Moremi

from the field

- The use of ICTs in the Cameroonian school system: A case study of some primary and secondary schools in Yaoundé 153
Abass Ngoungouo