digiTAL 2021

Book of Abstracts

**Conference Dates
2nd and 3rd December 2021**

**Venue:
Online on Zoom
(Hosted from South Africa)**

In association with

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Edited by: Dr Upasana G Singh

Editorial

This book of abstracts of the second digital conference themed "THE JOURNEY BEYOND" showcases research and practices which have come around based on need, the COVID pandemic, and the need to ensure education progresses in adverse challenges.

This second conference to be held on 2-3 December 2021 once again takes place completely in a digital environment due the effects of the disruptive era of COVID-19. A total of 68 papers submissions were accepted from South Africa, Zimbabwe, Ghana, Mauritius, Italy, Australia, Oman, Kenya, India and Zambia. The outcome of this overwhelming response has been two publications, a book of abstracts with 40 abstracts and a conference proceeding with 20 fully double blinded refereed papers. The papers covered many areas including COVID-19 in higher education, pedagogical practices in online and distance education, curriculum design, student engagement in the digital environment, digital environment in the secondary school's quality assurance in an online environment and subject specific digital teaching and learning research.

This 2nd edition of digiTAL2021 showcases the richness of research that takes place internationally within the walls of the ivory towers of the higher education sector.

Finally, our thanks go out to the keynotes who have made time to enlighten us with their knowledge and experience and our collaborators of this conference, the Victorian Institution of Technology, Australia, Amity University and e-Merge Africa.

Professor Sid Nair (Victorian Institute of Technology, Australia)
Dr. Upasana Singh (University of KwaZulu-Natal, South Africa)
digiTAL 2021 Co-Chairs

Preface

Necessity is the mother of invention, and Prof Yunus, Nobel Prize Winner, often adds, "and science-fiction is the father".

COVID-19 has brought us on the brink of a breakdown in various spheres of the previous "normal" society. Yet, life had to go on, and this brought humanity to look into new ways, adapt existing or overlooked means, to continue routine "normal" activities.

Yet, COVID-19 allowed the world the luxury of a paradigm shift. Suddenly, video call and online meeting applications and platforms became the essential commodity when they were for years taken as an unwanted solution that prevented physical, social interaction and mobility of people. Internet became the only way to be connected to the outside world and the main channel for many activities, like shopping, socializing and education.

An old Science-Fiction movie talked of space as "the final frontier", and the digiTAL 2021 conference theme, "The Journey Beyond", is a fitting phrase that brings me back to the words of Prof Yunus. In its traditional form, education was so deeply rooted in the face-to-face mode that the pandemic has indeed brought unprecedented chaos. Academia, in collaboration with industry, is a powerful and resourceful duo. We are delighted by the number of solutions that cropped up to improve and maintain education services. Thus, we saw novel ways to conduct exams, we saw regulatory bodies finally accepting online assessment, the use of virtual reality and specialized apps for practical sessions. We have come a long way since December 2019, yet, there is much more in the journey ahead. Education is also about quality, relevance and currency. How can digital education activities be quality assured? How can a lecturer ensure the students are receptive to the online teaching? So many questions require further discussions before we reach some degree of agreement.

This conference comes at a very opportune time. We look forward to excellent contributions, insightful ideas and novel ways of improving the education sector.

I wish all of you a happy Conference.

Prof Kiran Bhujun
Director and Vice-Chancellor
AMITY (Mauritius) - digiTAL 2021's conference associate

Is the Sudden Shift to Blearning possible?

Dr Kaviraj Sharma Sukon
Director-General, Open University of Mauritius

Abstract

During the pandemic many traditional secondary and tertiary education institutions were forced to move to blended and/or online learning. We believe that unplanned and rapid shift to online Blearning usually result in poor learner experience. How can we negotiate this shift in order to be successful?

Aftermath of the pandemic: Lessons learnt for engaging students

Dr Sara de Freitas

Director of Research and Professor of Virtual Environments at Coventry University, United Kingdom

Abstract

As an educator involved in delivering high quality online and face-to-face education for over 20 years, I have been struck by the different place we find ourselves in just two years after the worst pandemic in over a hundred years. This talk will explore what vulnerabilities were exposed, what lessons have and need to be learnt in the aftermath of Covid-19 and what future learning might look like, looking at the research and reports published by and for teachers and picking out some of the lessons for educators in public, private, primary, secondary or tertiary education. The talk also includes personal reflections on the changes to teaching and learning. It will also include an illustrative case study about an online school in the UK which doubled student numbers during Covid and developed a new education model. Lessons for how to deliver effective online education, issues around the digital divide and techniques for implementing a more holistic education to students will be touched upon in my interactive conversation with the audience.

The Hero's Learning Journey: harnessing the power of play in learning design

Natalie Denmeade

Learning Content and Development, Cultural Infusion, Australia

Abstract

Approaching education from the perspective of a game designer can harness the natural power of play in learning. As educators, we can use a gamification design process to reframe learning goals to be more appealing and more achievable. In this workshop, you will learn how to design effective and engaging educational programs based on the Hero's Learning Journey planner. You will be provided with a step by step guide on the design process. Background information is offered to help you understand how learner motivation will change from the first steps as a novice through to becoming an expert, or even a visionary! Conversely, we can predict what will cause learners to disengage or dropout and devise strategies based on these somewhat predictably behaviour patterns. This session will explore the world of gamification, giving participants an understanding of the key issues, benefits and strategies for introducing gamification across all ages and learning contexts.

Contextualizing TPACK within the design of systems and culture

Prof Punya Mishra

Associate Dean of Scholarship & Innovation and Professor, Mary Lou Fulton Teachers College, Arizona State University, USA

Abstract

The COVID19 pandemic brought home the importance of technology in teaching and learning. That said, it is not clear that most educators truly took advantage of the possibilities of technology to transform their practice. Despite extensive work around the TPACK framework, which describes the types of knowledge teachers need to design effective uses of technology, there has not been any significant change in how technology is used for teaching and learning. In this presentation I argue that, the TPACK framework does not exist in a vacuum but rather technology integration works within broader systems and cultures of practice which often define or constrain the kinds of moves teachers can make in pedagogical space. As systems and cultures mutate, and as new technological artifacts exhibit potential for educational application, teachers must adjust their knowledge, practice, and skills accordingly. In this presentation I will introduce our current work on the five spaces for design framework as a conceptual tool that provides us with a way to shift perspective and reframe problems and solutions in technology integration. These issues become even more salient in the current context of emerging from the pandemic, providing both opportunities and challenges.

Holistic Approach to University Education for Work Employability for the New Normal – Case of University of Technology, Mauritius

Diroubinee Mauree-Narrainen, Kesseven Dambeegan Padachi & Aleesha Boolaky
University of Technology, Mauritius

Abstract

After experiencing two lockdowns in Mauritius precisely mid-March 2020 to end of May 2020 and early march 2021 to end of April 2021, students found themselves in a very difficult situation to secure work placement during Covid19 Pandemic while employers from industries have been very hesitant to recruit students due to their economic situation and fear the fast spread of the virus. This has become a very challenging situation for students to gather on job knowledge, skills and develop the right attitudes and attitudes for work placement which is a compulsory component as part of their curriculum. This research has attempted to explore the possibilities of filling this gap of work placement opportunities for students at the University of Technology, Mauritius. Our project has successfully achieved 5 goals right from the completion of the research project to pioneering new model for research. The research methodology was purely a qualitative approach through a research project conducted during the period January 2019 to March 2021 whereby different categories of students studying different fields were recruited for different tasks. In addition the university Alumni was involved to support in this project. 24 students were trained and 7 students from the Alumni were involved. The purpose was to have students support towards the completion of the project as well as grooming them towards work employability. Various teaching and monitoring strategies were adopted to ensure the ultimate aim of conducting work placement and student mentoring are achieved. The findings have brought forth (i) different types of knowledge, (ii) skills more precisely critical thinking, problem solving, creativity & entrepreneurism, (iii) deterministic & motivating behavior, (iv) practical, endurance, work-oriented attitudes, (iv) universal and societal moral values which are all merged together to contribute in the making of a qualified graduate to face the challenges of the job market.

A Project-Based Approach to Building Organisational and Staff Capability at the University of South Pacific (USP) Emalus Campus, Vanuatu which is Strategic, Scaffolded and Sustainable

Lorraine Bennett

Lorraine Bennett Learning and Teaching Consultancy, Australia

Abstract

The design and provision of institute-wide professional development for staff working in higher education settings in developing and under-resourced countries, is both rewarding and challenging. It is particularly complex when English is not the first language of the participants and when previous exposure to staff development and team-based activities has been minimal. Face-to-face workshops designed to engage staff in workplace conversations and to identify staff and campus development needs were conducted at the Emalus Campus, Vanuatu in 2017 and 2018. These interactive sessions led to the development of 15 team-based projects. Fifty-four academic, professional, and administrative staff, including the campus director and senior campus managers attended these voluntary sessions and participated in the team building activities and project designs. Several original, tangible learning tools and artefacts were used in the workshops. They provided a bridge from theory to practice and gave the team members the confidence and know how to design and document their project plans and strategies. This report describes the professional development activities undertaken to arrive at the projects and final action plans for implementation during the period 2019. Formal evaluation of the project outcomes was impeded by the outbreak of the COVID-19 pandemic in 2020 which banned travel to Vanuatu to gather direct feedback from the participants. However, a report on the initial phases of the professional development program is worthy of dissemination and makes a significant contribution to discussion on the value of providing project-based staff profession development, especially in developing countries.

Are e-Assessments Testing Subject-Specific Learning Outcomes or Digital Proficiency?

Martin Butler and Salomon Van Wyk
Stellenbosch University, South Africa

Abstract

Higher education institutions (HEI) are exploring new online learning methods that change how learning activities, including assessments, are performed. Assessment forms an integral part of quality assurance of learning and measures whether a particular learning process achieves the stated learning outcomes. Assessments in Higher Education are increasingly digitised and students are required to use computer devices to display their attainment of learning outcomes. Although learning outcomes are subject-specific digital assessment requires technical proficiency. It is plausible that assessment methods may be testing abilities other than intended learning outcomes resulting in unfair assessment practices. The study used word count in summative essay-type e-assessments as a proxy for digital fluency to investigate the relationship between the length of answers and grade awarded for a postgraduate business course. A systematic approach was followed using scatter plots, analysis of variance correlation testing, and regression analysis. Results indicated a weak positive relationship between the word count and grades, highlighting the complexity of factors impacting student learning and their ability to demonstrate mastery of learning outcomes. Although the study indicates that a lower typing speed should not significantly disadvantage a student's ability to perform, it does not mean that some students are not unfairly disadvantaged by e-assessment, as not all students operate in a uniform setting. Access to faster devices, better screens and technology, higher bandwidth speeds and unlimited data at home (or lack thereof) can arguably create a disparity between affluent and impoverished students doing the same course at the same HEI. Further investigation is suggested to explore the relationship linking test scores to student's access to digital resources, including the availability of bandwidth and digital proficiency.

Reflections and Lessons Learnt on Teaching, Learning, and Assessments in a First-Year Introductory Course During the Covid -19 Pandemic

Pariksha Singh, Jayshree Harangee & Tania Prinsloo
University of Pretoria, South Africa

Abstract

When Covid-19 forced universities in 2020 to close the doors from face-to-face education and welcome an online hybrid approach, academics had to adjust all educational practices to ensure quality and proper education continued successfully. An introductory Academic Information Management course that deals mainly with computer literacy and has a cohort of over 9000 students had to find ways to help bridge the digital gap using online digital technology. The issues with internet connectivity, load shedding, and students not having compatible devices were just the start of the problems. Many students could cheat the online systems because assessments were not set for online learning; facilitators were not adequately prepared for this new shift to online education, and many felt stressed and overwhelmed. This study discussed the strategies implemented and the lessons learned after universities' shutdown in 2020 and the new approach in 2021. Digital technology plays a critical role in online education, and the assumption that students are ready to use any technological system for online learning is considered. Learner-centred teaching and learner engagement were some of the goals the module aimed to satisfy. Online collaborative learning theories that dealt with constructivism, behaviourism, and cognitivism were explored and implemented to improve teaching and learning. Furthermore, the resources on Blackboard Learn were also well-designed and managed. Therefore, students' engagement, learning, and performance all significantly improved. The reflections of this study can help academics in a similar environment adjust to online education and adopt the learning strategies that have proved to be successful. In this way, we discovered that incorporating the learning theory within the module transformed the online environment into a more resourceful and successful learning environment. However, further investigation is needed to explore approaches to engage and innovate large cohorts of students for teaching, learning and assessment to continue successfully in a hybrid online approach.

Turning Constraints into Opportunities: Online Delivery of Communication Skills Simulation Sessions to Undergraduate Medical Students during the COVID-19 Pandemic

Reina Abraham
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Abstract

The COVID-19 pandemic impacted higher-learning institutions. Communication skills training in medical education has needed innovative solutions to adjust to the situation. In times of change, evaluation channels should be developed, and any problems raised by learners and educators should be responded to rapidly. A remotely facilitated simulation-based training programme was piloted by the clinical skills laboratory tutors using Zoom as the online platform. The goal of the pilot session was to establish a communication skills training strategy remotely, to test an online session using the defined online platform, and to assess its effectiveness. Though the conventional format of locally facilitated face-to-face simulation-based training is easier to use and experience, training on virtual simulation-based communication skills enabled through the online portal has been described by participants as both feasible and effective. The results show that an efficient educational environment can be provided by remote simulation of communication skills. An important requirement for learner engagement with remotely facilitated simulation-based training is the development of contextual understanding, multiple exposures and a respectful learner-teacher relationship. Any negative impact of remotely facilitated simulation-based training may be concealed by an overarching high perceived value of simulation-based trainings in general. This pilot online simulation programme shows the value of using this modality and lays the foundation for communication skills teaching during similar future crises. There is also the need to consider how online simulation can be sustained after the pandemic and not just returning to the conventional face-to-face teaching and learning.

SWOT Analysis of Academics' Experiences and Changing Pedagogical Practices in Teaching a Scientific Academic Literacy Course Online

Vanessa Singh & Vasanthie Padayachee
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Abstract

The sudden move to online teaching, due to the corona pandemic, resulted in academics also finding themselves in new terrains, adapting to a new way of life, technology, navigating obstacles and changing their pedagogical practices to make learning accessible. Face to face curricula had to be adapted for the virtual environment and changes to the way modules were previously taught and assessed. The transition to social distancing without academic distancing was not a smooth transition and involved academics relooking at their disciplinary content, the way they taught their courses as well as reflecting on what would now work best online and making the necessary changes to their pedagogical practices. This study focuses on the journey of 2 academic staff teaching a scientific academic literacy course online and their experiences and the changes they made to their pedagogical practices. This qualitative study uses a combination of interpretivist paradigm and a SWOT analysis as a theoretical framework. The experiences and pedagogical practices from their personal accounts are mapped onto the SWOT analysis – highlighting strengths (curricula and pedagogy), weaknesses (challenges they encountered), opportunities (encountering innovation) and threats (assessments and the growing administrative responsibilities). While this study is in the field of academic literacy the experiences of academics and the challenges they faced and the change they made provides insight for other fellow academics travelling on the online journey into another world.

An Evaluation of the Blended Learning Model in Legal Education: is Blended Learning Still Relevant for Educating the Legal Practitioner of the Future?

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Independent Institute of Education, South Africa

Abstract

The arrival of the Coronavirus Pandemic in South Africa necessitated a move from the traditional methods of educating law students to teaching and assessing in the online sphere. This manner of educating law students was unique, taking legal education into the online space, with minimal interaction between students and lecturers in the traditional "blended learning" classroom as government regulations and national lockdown prohibited such contact. This meant that the blended learning model was impacted, as the education of law students went online with some blended learning only taking place when national lockdown restrictions were relaxed. This brings into question how blended learning as a pedagogical model can still be used to educate law students. It was certainly a new measure for both students and lecturers to follow, and it brought its own challenges, meaning that new techniques of support had to be developed for lecturers and students, in what for most of them was a new learning space. The value of blended learning for legal education must then also be assessed in terms of what the legal practitioner of the future needs to know, given that courts are transforming to meet technological needs and they are operating in the online space, for example, with the admission of attorneys and advocates via communication platforms such as Zoom. The purpose of this paper is to evaluate blended learning as a pedagogical model for legal education within the framework of the Fourth Industrial Revolution (4IR), taking into account how challenges precipitating from it during the national Coronavirus Pandemic can be addressed with support measures for both student and lecturer. In addition, its value will also be assessed with reference to what should be taught to legal practitioners of a near and technologically advanced future.

Problematising the Teaching of Formal Methods (FMs) in Open Distance e-Learning (ODeL)

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University of South Africa, South Africa

Abstract

The steep learning curve in mastering essential discrete mathematics and logic makes the teaching of formal methods (FMs) as part of a software engineering programme mandated by the ACM/IEEE challenging, even in a face-to-face environment. These challenges are compounded in a distance teaching environment, known as online teaching or Open Distance e-Learning (ODeL) through a Learning Management System (LMS). Some researchers report success with the teaching of FMs in face-to-face laboratory work, but with the Covid-19 pandemic even those institutions had to resort to online. While pandemics may pass, traditional ODeL institutions continue to deal with the challenges of online and blended tuition of FMs, while still being faced with the general mathematics-FMs online teaching challenges. In this paper we synthesise the challenges of the ODeL of FMs as elucidated in the literature as well as experienced by the researchers through the teaching of FMs material. Challenges around the ODeL of FMs and the Moodle LMS are unpacked and on the strength of these challenges a problematisation framework for the ODeL of FMs is developed. The framework aims to synthesise the challenges around the teaching of the said concepts and is theoretically validated. Future work would include the validation of the framework and development of a solution framework to address the problematisations.

Exploring Infusing Graduateness in an Introductory Programming Module in an ODeL Environment

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Abstract

Graduateness is an elusive quality students are expected to develop while doing a degree. It includes both cognitive and non-cognitive skills, but non-cognitive skills are seldom directly addressed in teaching. This paper presents a description of an exploratory endeavour to infuse certain aspects of graduateness in an introductory programming module in an ODeL environment. The aim was to support students in assuming responsibility for their own learning to elicit a positive effect on the drop-out rate and the pass rate for the module. Various measures were introduced, inter alia, weekly e-mail announcements to assist students with keeping up with the study programme, mastering the study material, and to introduce students to topics to sensitize them to 21st century skills and self-development. Some of the other measures implemented include introducing Microsoft Teams as an additional communication channel to encourage student engagement and requesting students to reflect. Covid-19 changed circumstances for both students and lecturer. It increased the pressure under which students studied as well as the way the exams were conducted. As a result, it is not possible to measure and confirm how effective these measures were in reducing the drop-out rate or improving the pass rate for the module. However, reflecting on the effect of the measures implemented revealed some valuable lessons for possible future research for developing graduateness in an ODeL environment, and confirm that a formal study is justified and will contribute to research on graduate attributes in higher education in SA.

Meet Lisa: The Robot Who Stole Your Job

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Abstract

The Legum Baccalaureus (LL.B) degree was once a sought after professional qualification, attracting scores of aspirant applicants seeking to unlock the gates to a prestigious and financially rewarding career. Not so, anymore. Faculty beware! The year is 2029. The robot lawyer LISA developed by three UK lawyers in 2019, crunches through 2000 property contracts a day, making a mint for her owners and making mincemeat of human lawyers who can service 50 to 100 property clients a day at best. Her counterparts work in tax, estate planning and debt collection without lunch breaks or overtime. In court rooms around the country Rumpole's keen instincts and sharp wit have been replaced with digital tools to detect lying witnesses, and the halls of the Law School are empty. This paper will explore three questions law faculties need to be asking *now*: Will the LL.B degree continue to hold value for students? What careers are we preparing the LL.B graduate for? What attributes do law graduates need to develop during the degree? The pedagogical approach of the Activated Classroom (Blewett *Wake Up Class!* Available at https://www.act.click/book.html) is presented as a model, for the development of appropriate 'survival skills' in future LL.B graduates. The paper envisions the development of novel curriculum components and a refashioning of course structure from the current, rigid semesterised and sequential degree progression to a qualification that is more flexible, both as to entry/exit points, student choice over curriculum content, and preferred modes of study (distance, contact or blended).

The Journey to 4IR: Equipping today's Chemical Engineering Students with Skills for Tomorrow's Workplace

Leroshka Murugan [a], Anusha Singh [b], Taryn Gore [b], Annegret Stark [b,c] and Anja Philipp [*a]

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Abstract

The Fourth Industrial Revolution (4IR) is changing how we work. The next generation of workers needs to get ready for the new era by acquiring specific skill sets. Higher Education Institutions need to prepare students for a 4IR era to meet the needs of changing work environments. In a project launched at the University of KwaZulu-Natal in South Africa (SA), we focus on Chemical Engineering students and examine how the current curriculum prepares undergraduate students for the 4IR. The aim is to transform the undergraduate curriculum at one School of Engineering to adapt to changes in society, technology, and the African environment, specifically the South African context. The project is based on a mixed-method design, including analysis of curriculum documents, questionnaires and focus group interviews with stakeholders from Industry to rank relevant 4IR skills of Chemical Engineers in an African context. In this paper, initial results are presented, focusing on the 4IR skills needed by future generations of Chemical Engineers in SA, followed by a reflection on the dynamics in developing countries and which role the 4IR plays in such contexts. The project is pertinent because it will contribute to curriculum transformation by developing a blueprint which can then be used in other STEM disciplines in the future. Transforming the curriculum of Chemical Engineering in preparation for the 4IR is crucial if Higher Education Institutions want to continue to offer high-quality Education that is relevant locally and globally.

Didactics Has Evolved to Digital Age Didactics

Clement Ayarebilla Ali & Peter Akayuure
University of Education, Ghana

Abstract

Didactics has evolved from pre-didactics, didactics-dialectics, classical or traditional didactics and now to digital age didactics. However, few studies allude to the significance of this evolution. We present a case study of digital age didactics of student-teachers exploration using the virtual class platform to discover prominent female mathematicians. With ethnographic analysis of the results, it was discovered that student-teachers successfully employed the platforms to plan and design, teach and learn, diagnose problems, and participate in virtual activities. It was concluded that the framework was suitable as it allowed for collaboration, participation and innovation. We therefore recommended that all assessment for, assessment as and assessment of criteria be channelled into digital age didactics.

Virtual Reality Education: A Potential Catalyst to the Next Stage of the Evolving Pedagogy

Kristina Tam, Lizette de Wet & Liezel Nel
University of the Free State, South Africa

Abstract

Teaching and learning are often still based on a traditional education mentality: children must learn while sitting behind a desk, with learning material limited to textbooks and a ridged syllabus set out by governmental institutions (Tularam & Machisella, 2018). The COVID-19 pandemic, however, forced educational institutions to utilise technology to be able to continue with education. This study aims to challenge the current traditional education approach by determining if the implementation of virtual reality into educational practices within schooling systems have the potential to alleviate the static conventional teaching and learning methods. The researchers adopted a qualitative research method to analyse whether the implementation of virtual reality within the education system could be beneficial. A virtual reality education prototype was created to present the photosynthesis process in an interactive manner. Learners (aged between 10 and 13) would immerse themselves into this virtual environment, interact with the objects, and complete tasks about the photosynthesis process. The evaluation involved an initial expert review, followed by a usability test where representatives from the target population participated. The results of the usability study were incredibly positive and revealed that the participants thoroughly enjoyed the learning experience. Although they did quite well in the assessment part, the problems that they encountered could be attributed to needing more time to get familiar with the environment. The results indicate that virtual reality within education systems have the potential to empower learners to take control over their education and shape understanding through experiences.

Definite Possibility or Deliberate Mistake – A Comparative Case Study of Undergraduate Students' Academic Performance in the Traditional Versus Online Pedagogy in Mauritius

Vanisha Rajaysur & Ashish Gadekar
AMITY Institute of Higher Education, Mauritius

Abstract

The impact of Covid-19 in Mauritius has given a new paradigm to e-education with the interactivity based on teaching and learning between students and teachers through an online platform. This paper explores in depth the practicability and realistic nature of the Tradition and Online pedagogy of undergraduate students' academic performance in a Higher Education Institutions (HEIs) in Mauritius. A descriptive analysis was done among a sample of Undergraduate students enrolled in a Business Administration programme for 6 respective cohorts (from April 2018 till August 2021) in four modules, name, Principles of Management, Microeconomics, Business Stats and Maths, Computer in Management and Microeconomics. Moreover, the Semester Grade Point Average (SGPA) was also taken into consideration as a variable for analyzing students' performances. This research findings will contribute to the literature on undergraduate students' academic performance from Traditional to Online pedagogy. The outcome indicates that there was no significant difference in students' performance when the traditional face-to-face mode and the online policy applied. The grades remained nearly the same irrespective of the different cohorts. It is highly recommended that HEIs need to focus on more dynamic approaches like socio constructivism, heutagogy and connectivism regarding the new normal mode to ensure continuity of online pedagogy. Further research can explore students' performance in other academic programmes and at the postgraduate level.

The Impact of COVID-19 on Students Completing a Blockchain Course

Andre P. Calitz , Margaret Cullen & Martin Stolk
Nelson Mandela University, South Africa

Abstract

The growing popularity and use of Blockchain technologies by crypto-currencies, such as Bitcoin, has forced education institutions to introduce new Blockchain courses. The Blockchain courses consist of theoretical and practical components. The practical components require students to work with new technologies, such as programming in Solidity on the Ethereum Blockchain platform. The COVID-19 pandemic is an international concern, which has affected students and academics. Education institutions have had to switch to digital ways to present course material. Students had to use different technologies to complete their studies, adjust to working from home and cope with various pandemic challenges. Programming oriented courses require students to complete practical assignments and students rely on academic support during these sessions. The purpose of this study was to compare the offering of an Honours Blockchain course before and during the COVID-19 pandemic. Students on the Blockchain course complete course evaluations annually. The results were thematically analysed and indicated that the students during 2020 had to face additional challenges, such as working from home with limited assistance when completing practicals. They had to solve Blockchain coding related problems by using programming forums and Internet programming sites, YouTube videos and Blockchain related blogs. Thus the 2020 students had a more 'real-world' programming experience, problem-solving on their own, without the face-to-face assistance from experienced instructors during practical sessions to assist with coding problems.

A Student's Perspective on the (Forced) Adoption of Online Learning at a Private Higher Education Institution

Priya Ramgovind, Shamola Pramjeeth & Willy Engelbrecht
Independent Institute of Education, South Africa

Abstract

Online learning benefits students with the infrastructure to manage and navigate online learning platforms. Before democracy, the South African education system sowed divide between the education of different social classes, of which the effects are still evident. Transitioning from secondary education to tertiary education is one that sees a widened gap in access to higher education and graduation success given the varying levels of exposure, infrastructure and experience students have to online learning. Exacerbating this was the Covid-19 pandemic, which required students to (forcefully) adopt online learning as a means of ensuring the continuation of their education. Online learning benefits students with the infrastructure to manage and navigate online learning platforms. The target population of this study was third year bachelor's degree students from a South African private higher education institution. An interpretivist paradigm underpinned by a qualitative methodology was applied using online semi-structured interviews to collect rich data. Thematical analysis enabled the researchers to identify key themes from the students perspectives on their adoption to learning. There is currently a dearth of African-based literature that explores the advantages associated with online learning given the socio-economic and digital literacies of students transitioning into higher education. It will serve as a contemporary reference point for higher education institutions wanting to engage in a student-centric online learning environment. This study provides contemporary information pertinent to understanding student perceptions towards online learning and the context within which online learning should be reviewed. Technology and access are interdependent resources that supports successful online student engagements. Students' ownership of learning was found to be pivotal contributor to the adaptability of online learning. The absence of which stagnated student progression.

Lifelong Learning in Higher Education: Students' Reflections on Integrating Sage Pastel into a First-year Accounting Module

Tania Prinsloo, Komla Pillay & Pariksha Singh
University of Pretoria, South Africa

Abstract

Lifelong learning opportunities exist within digital online contexts at universities. The pillars of lifelong learning include learning to know, learning to do, and learning to be. The literature review focuses on the essential learning dimensions, such as self-directed learning, collaborative learning, and learning on-demand. One of the principles of lifelong learning is to cover content that is relevant to the learner and can be applied practically so that students see a reason for learning by making it applicable to their study of work and other responsibilities of value to them. In that context, a first-year accounting module now includes a Sage Pastel component, where students have to work through the material and apply it in the accounting module. Kolb's learning cycle is used as a theory to structure the cycle of abstract conceptualisation, active experimentation, concrete experience, and reflective observation. 361 Students completed the online questionnaire, consisting of thirteen questions, mostly closed-ended questions. The quantitative questions asked were analysed using SPSS version 13 and consist of descriptive statistics and cross-tabulations. The open-ended qualitative questions were coded and arranged into themes using ATLAS.ti version 9. The main findings suggest that out of the 361 students answering the question, 249 either strongly agree or slightly agree with the statement "Do you find the assessments useful?" Also, 255 students agree that Sage Pastel helps them in their personal development, and 306 students agree that it helps with their professional development. Students also find the online videos to be the most helpful resource, followed by the eBook, discussion boards, and online Blackboard Collaborative sessions. It is concluded that students value Sage Pastel as a practical skill to use when entering formal employment.

Flexible Learning in Online Foreign Language Learning Environments for National and International Education

Giovanna Carloni
University of Urbino, Italy

Abstract

Universities have increasingly engaged in distance teaching in the last two years. Designing online/blended teaching requires instructors to use suitable digitally-enhanced pedagogical practices, such as HyFlex (Hybrid-Flexible) (Beatty 2007, 2010, 2019), catering to learners' complex and ever-shifting needs from a pedagogy of care perspective (Friedland 2016; Motta and Bennett 2018; Bozkurt et al. 2020; Jackson 2021). In this light, this presentation aims to illustrate how innovative digitally-enhanced collaborative learning environments can be designed and implemented, adopting a design for learning approach enhancing students' agency and engagement in online contexts (Goodyear 2015; Rapanta et al. 2020). To this purpose, on the basis of the findings emerged from two studies carried out in online foreign language teacher training courses at an Italian university, a framework suited to designing flexible digitally-enhanced innovative collaborative learning environments suitable for connecting students locally and globally while engaging them consistently in multimodal knowledge co-production will be presented. The key role of collaborative activities (Darby and Lang 2019), devised on the grounds of a socio-constructivist view of knowledge (Selwyn 2016) implemented online through the use of newly emerging educational technologies from an open pedagogy perspective, will be illustrated along with various types of digitally-enhanced tasks fostering collaborative learning effectively. This presentation will be especially useful to instructors planning to design innovative collaborative online courses fostering students' active learning and engagement.

New BA Degree Program Experience for Catholic University Undergraduate Students: A Case Study of the Department of Development Studies at St Joseph's Theological Institute NPC, South Africa

Mfazo Cliford Madondo
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Abstract

The Catholic University is a theoretical position in revealing the essence of Catholic higher education. This paper draws from this stance and is proposed to focus on the undergraduate students' online experience of a new BA degree program during lockdown and future-centric of Catholic-based higher education in South Africa. With the arrival of COVID-19 pandemic lockdown in South Africa end of March 2020, the St Joseph's Theological Institute NPC had just begun to roll out its new Bachelor of Arts Degree in Human and Social Development. The Institute stopped the action process in teaching and learning in all degree programs like many institutions of higher education in the country. The need arose to revive and to save the academic year. This was a task based on a collaborative conversation between the management and key stakeholders especially the students. Given the new circumstances a crucial point of enquiry is at stake operationally. It is important to seek knowledge and understanding around the undergraduate students' online experience of a new BA degree program during lockdown and way this experience informs the future of this program and the institute at large. The results are expected to indicate the way the St Joseph's Theological Institute NPC is dealing with COVID-19 pandemic lockdown crisis at academic operational level. Further, the knowledge is required around new areas of collaboration that may emerge as re-imagining the lasting blended teaching and learning for new degree programs. In view of this problem, the question of enquiry is what is the online experience of undergraduate students in a new BA degree program during the COVID-19 pandemic induced lockdown at the St Joseph's Theological Institute NPC, South Africa? As one of the few institutional symbols of Catholic University in South Africa online experience of undergraduate students of new degree programs is a relevant issue where the study outcomes entail the engagement of blended teaching and learning. The methodology to be used in this paper is quantitative. Data is envisioned to be collected using the Survey Monkey platform from 17 SJTI students enrolled in the new BA degree program since February 2020 into the end of Semester 1 of the academic year 2021. Results are anticipated around the collaboration as the way of dealing with COVID-19 crisis at operational level in teaching and learning of new degree programs in Catholic University. Contribution is expected to be made towards the managing new degree programs in private higher education of Catholic University orientation in South Africa.

The Psychological Impact of the COVID-19 Pandemic on Academics in South African Higher Education Institutions during the COVID-19 Pandemic

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Abstract

During the COVID-19 pandemic, striking the balance between work and home life presented many challenges for academic staff at higher education institutions in South Africa. Academics were required to make an abrupt physical, psychological, and social shift within a matter of days. The lockdown restrictions, which meant working from home, and the switch to online teaching, left many academics reeling as they tried to navigate their new working environment. It brought about daunting challenges and accompanying new anxieties. Given the nature of the pandemic and the continuing after-effects thereof, it is important to explore and better understand the psychological impact on the work/life balance of academics in higher education. It is highly probable that post the COVID-19 pandemic, higher education institutions will continue to use a blended (face to face and online) teaching and learning approach, and thus academics may work predominantly from home. The proposed study will not only unpack the meaning of work/life balance, but also provide an in-depth exploration of the psychological impact of the COVID-19 pandemic on the lives of academics in South African higher education institutions. This research will be conducted using a qualitative research design. The purposive sample of eight to ten participants will comprise of full-time academics who were employed at higher education institutions in the Western Cape (South Africa) in 2020. Semi-structured interviews will be used to collect data. Data will be analysed using thematic analysis where the researchers will make meaning of the participants' recounts of their lived experiences. Finally, the study will provide insight into the psychological impact the COVID-19 pandemic had on academics as they strived towards finding work and home life. It will consider the changes in, and implications of, the working environment of academics in higher education in the post-COVID-19 era.

Relationship Between Students' Self-Directed Learning and Motivation for Online Learning at Undergraduate University Level in Mauritius

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Abstract

The recent pandemic has sparked the growth of online learning throughout all levels as never before. It really has generated an enormous incentive for scholarly investigation into teaching strategies. The goal of this study is mainly to determine whether there is a relationship between students' self-directed learning and their motivation for online education. Studying readiness is described as the abilities required by learners to study, with an emphasis on self-directed studies. This study investigates how university graduates stayed inclined to study even through all of the obstacles they faced and overcame throughout the COVID-19 pandemic. As a result, the study was carried in Mauritius, however the potential advantages extend beyond the borders of the country. Data were collected by administering an online questionnaire to 422 students chosen at random who are enrolled in an undergraduate course in the Mauritian universities. The degree of directed learning and desire to study was ascertained using descriptive analysis. To predict the association between students' motivation to learn and their directed learning readiness, a Pearson Correlation test was done. In addition, a regression analysis was performed to assess any impact of the elements of directed learning on learners' motivation in an online learning environment. According to the findings of this study, the learners are motivated and dedicated to their studies. The research revealed a relationship between learners' online learning willingness and motivation. The study results revealed a significant relationship between rising levels of online learning capability and rising levels of learner motivation. Policymakers in charge of Higher Educational Institutions should provide all of the necessary resources for educators to adopt online learning.

Reviewing the Application of GitHub in Computer Science Education

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Abstract

GitHub is a contemporary version control and collaborative platform that is gaining prominence in both the open source community and private institutions. Its support for integration with testing frameworks and popular software development tools has increased its popularity within the software industry. While some traditional universities may still advocate for retaining a strong component of Computer Science (CS) theory in their programs, employers in the software industry have a growing preference towards graduates with prior exposure to common industry tools such as GitHub. The increasing presence of MOOC platforms challenges traditional forms of education by promoting industry relevant short courses and prioritizing applicable skills over academic theory. The increased access to industry tools to academic institutions at little or no cost, presents an opportunity for such institutions to embrace change and model their academic offerings towards industry demands. This study reviews contemporary studies that have successfully incorporated GitHub into CS curricula. It seeks to highlight the diversity of potential applications of GitHub into CS education as well as the pros and cons of its use in such contexts. It will serve as a useful guide to CS departments that are exploring its adoption in a manner that compliments the theoretical foundations of this field. The pedagogical benefits and operational efficiencies that this platform offers are documented to demonstrate that its adoption in not limited to meeting industry demands.

Application of Digital Technologies in the 21st Century. Literature Review of Experiences, Opportunities and Challenges in Higher Education in Oman

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Abstract

This study aimed at designing a framework to be adopted when implementing digital technology in Higher Education Institutions (HEIs) in Oman. This study is guided by an interpretivism research philosophy. This philosophy uses a qualitative research design that is interpretivism in nature. The design adopted the use of content analysis as the major research instrument. This study used search engines like Google Scholar, Google Advanced Search, Research Gate, and Masader as the key secondary data sources for the study. Literature related to online books and other academic blogs was also be explored. Literature review unpack the discourse related to digital technologies that are ideal for HEIs learning. Additionally, study identifies the appropriateness of the different digital technologies for use in HEIs in Oman. The secondary research objectives include "to identify opportunities that are presented by digital technology in HEIs, to establish challenges that are faced when using digital technology as a teaching and learning tool in HEIs and establishing methods of implementing digital technology in HEIs at the most cost-effective and efficient manner". The period of search was limited to a decade, that is, from 2011 to 2021. The academic research journals are categorized into different study areas which are in line with the research objectives. Thematic analysis was conducted, and themes or areas of interest were determined by saturation. The study results broadened the scope and understanding of digital technologies that were used before and after the new normal. The study outlined the needs analysis for both the teachers and the students operating during this period. Results of the study were identified research gaps and contributed to the body of knowledge through the identification of digital technologies that are applicable in HEIs.

Towards a Framework for the Problematisation of Graduate Supervision of Computing Students in an Open Distance e-Learning (ODeL) Environment

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Abstract
This paper proposes a problematisation framework for scientific knowledge in the area of supervision of graduate Computing students (i.e., masters and doctoral students in Computer Science, Information Technology, and Information Systems) in an Open Distance e-Learning (ODeL) environment. The proposed problematisation framework is a three-tiered construct. The top tier questions epistemological, ontological, and methodological aspects of knowledge generation in the area under research. A second tier questions schools of thought and metaphors that guide knowledge in the research area. A third tier questions theories, practices, activities, tools, and text in the research area. The framework thus allows for the problematisation of a range of issues at the intersection between ODeL, graduate supervision and Computing research ranging from the assumptions and paradigms that inform knowledge in this research area to the practical aspects of day-to-day supervision of graduate students. The proposed problematisation framework holds significant benefits for baseline studies, as it allows not only for the identification of research gaps, but a problematisation in terms of underlying assumptions and conceptualisations, thus creating potential for the identification of strong research questions and research areas. Future work may include a validation of the framework and commencing projects in under-researched areas that emerge from the use of the problematisation framework.

Student Performance in Computer Programming Modules During the Covid-19 Pandemic Lockdown at a Private Higher Education Institution

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Abstract

In South Africa (SA), all Higher Education Institutions (HEIs) were challenged to complete the academic year 2020 under COVID-19 pandemic lockdowns. As a result, online teaching had to be arranged for most programmes, and submission dates had to be rescheduled. In addition, amendments had to be made to assessment strategy and institutional policies. This paper presents an abridged historical review of Covid-19 in SA – a post-education perspective. The paper accounts how a Private Higher Education Institution planned and reacted to the Covid-19 pandemic, focusing on the successes and failures of the Information and Communications Technology (ICT) computer programming assessment strategy. The article explains how the transitioning to three waves of teaching and learning occurred. An enterprise data warehouse was used to perform queries and analyse the historic assessment primary data of computer programming modules. The preliminary student data is transformed to reveal trends, patterns, and anomalies within the computer programming language modules using customised dashboards. The study's contribution is to showcase how imperative it is for HEIs to track students' performance using business intelligence tools such as dashboards to improve and promote student success.

Understanding the Perception Towards the Technology Adoption in Higher Education Institutions in Oman

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Abstract

This study aims at establishing a perception framework that integrates technology adoption in Higher Education (HE) learning institutions. This study is going utilize the pragmatism research philosophy which is aligned to the quantitative approaches to research. This study aims to use a cross-sectional approach applying a concurrent mixed approach. The objective and subjective methods of data collection will be used. This study used a structured questionnaire and virtual meeting as the main research instruments. A structured questionnaire will be designed and distributed through Google Forms to get information from the learner in HE institutions. Virtual meetings will be used to solicit information from teachers/professors who are currently practicing in HE institutions. A convenient sampling technique will be used to select the population and the distribution of the questionnaire. This study's secondary objectives are; to identify technologies that are ideal and applicable to HE learning environments, to establish opportunities that are presented by technologies used in HE institutions, and to find out the requirements for a technology-savvy generation in HE institutions. The literature review will be guided by the research questions and data analysis will be conducted using descriptive and exploratory methods. Data integration (both qualitative and quantitative) will be conducted to increase the generalizability of the research. This study framework will assist in improving the perceptions of digital learning during the new normal and some years to come. The results of the study will benefit institutions of HE and policymakers by providing answers as well as giving guidelines to what is ideal for service delivery.

Lecturers Readiness as a Factor in the Uptake of Teaching with Digital Technologies in Distance Learning: A Zambian Case Study

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Abstract

Despite technological advances in education, Sub-Saharan higher education institutions (HEIs) are reportedly still staggering under the burden of digital exclusion. Furthermore, crises such as the COVID-19 pandemic have a profound impact on digitally excluded students. Due to its flexibility and affordability for students in remote areas, distance education is a popular option for many African tertiary students. While teaching with technology made huge developmental strides in distance education in most developed countries, many HEIs in less developed countries do not yet benefit from the widely heralded 21st century technological developments. Literature abounds that many sub-Saharan distance learning intuitions still use traditional and outdated distance teaching and learning practices. The pivotal question begs: how do distance higher education lecturers in the group under study perceive the affordances of digital technologies? A Zambian focus group study was conducted to explore lecturer attitudes and perceptions towards integrating digital technologies into teaching and learning. Using a combined conceptual framework of the Technological Pedagogical Content Knowledge (TPACK) model and the 21st century 6C's model to frame the study, the current ecosystem was explored. Qualitative data were collected during focus group interviews, transcribed and analysed using Clarke's Six Steps of thematic analysis. The main finding of the study is that lecturers understand the importance of integrating digital technologies demanded by an ever-changing working world. The study identified the areas responsible for the observed lack of preparedness in the case under study. It offers guidelines on integrating affordable technologies, such as mobile technologies gradually and systematically, within the preamble of the challenges faced in terms of digital exclusion. Although the findings of this focus group study cannot be generalised on a broader scale, finding are in line with similar studies, amplifying the critical role of governance and leadership in HEIs to bring about the required change.

Hybrid Learning and Braided Technologies for Teaching Programming in a Post-COVID19 World

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Abstract

As the COVID19 pandemic has taken over the globe, remote working technologies and collaboration tools are widely utilised in several sectors, including teaching and learning in higher education. The field of Computer Science benefits from video conferencing, screensharing and remote desktop applications which allow lecturers to connect with students synchronously for class and for one-on-one support as well as to provide support resources including links and videos. As institutions return to partial face-to-face learning, it has become apparent that the way students learn programming has evolved – our approach of using classroom problem-based learning techniques has been confronted with the reality that hard lockdown restrictions equipped some students with autonomy and flexibility to learn using a technology medium that worked well for them. In the proposed paper, will explore the new reality that teaching programming cannot occur entirely in a face-to-face context nor in blended context. Instead, lecturers need afford students autonomy to engage with the curriculum through recorded videos, streamed live lectures or classroom-based lectures. This phenomenon presents a unique challenge for lecturers who now need to connect with students across multiple platforms using a space of their choosing. In our paper, we explore the phenomenon of hybrid learning from teaching programming to students at a South African higher education institution. Based on empirical research, our paper will present a model that for programming lecturers to incorporate into their teaching and learning to ensure that students are engaged across whichever medium they opt to use and effective learning takes place.

What are the Advantages and Disadvantages of Using Wiki in Mathematics Teaching and Learning?

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Abstract

The popularity of social media in the past few decades and the COVID19 pandemic have motivated many researchers to utilise social media tools, services and applications for educational activities in higher education. Wikis are amongst the media tools being used in teacher education. However, few empirical studies have investigated wikis in mathematics education. The current study investigated the advantages and disadvantages of using wiki in mathematics teaching and learning from the perspective of pre-service teachers. The methodology used is a quantitative approach in the form of a survey which was conducted amongst seven mathematics pre-service teachers who were given a group assignment that was done on a wiki page. In this survey, pre-service teachers had to reflect particularly on that assignment. Thematic analysis is used to single out commonalities and differences. The findings illustrate that there are advantages and disadvantages of using wikis in mathematics teaching and learning. Amongst the advantages posited by pre-service teachers were that wikis enhance reading and writing skills and allow them to collaborate and share ideas. The disadvantages that the pre-service teachers mentioned were that some of the students are not familiar with wikis and those who are familiar, used wikis casually only and not in mathematics teaching and learning, and that wikis are not used outside Blackboard. The results can provide guidance to mathematics education lecturers and mathematics pre-service teachers who wish to embark on using wikis in education more especially in mathematics.

Living, Learning and Leading University Reform in the Pandemic Shadow

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Abstract

In 2020-21, COVID-19 swept across the world and touched the lives of all communities. In many cases its impact was fatal. There were 173 million reported cases and 3.72 million reported deaths up to June 2021. This highly contagious virus severely disrupted the way we work, learn, rest and play. The effect on the economy was tangible. With little warning, businesses, restaurants, and shops were closed, workers either lost their jobs or were required to work from home. Many cities and communities experienced complete lockdowns for extended periods of time and targeted lockdowns continued well into 2021, in response to fresh infected clusters. With respect to education, schools and universities were closed and home-schooling for school-aged children and online and remote learning for university students became the norm. In attempt to capture the not so tangible aspects of the pandemic – the 'lived-experience' of university students, a research project was undertaken to flesh out the nuanced feelings and responses of students to the new way of living and learning. The data interrogated was student survey feedback sourced from several countries. A metaplectic phenomenology research methodology was used to interpret the data. In this approach researchers are encouraged to insert themselves into the research and report findings through stories, poetry, prose, and metaphor to capture the lived-experience or essence of the impact. An outcome of the study was an original three-part poem which captures experiences of living, learning and leading university reform in the pandemic shadow.

Remote Parental Assessment and Guidance for Occupational Therapy for Young Learners with Learning Disabilities during Covid19 Pandemic Lockdown

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Abstract

Young Learners with learning disabilities or having a late learning developmental curve are secluded from normal learning activities in schools and societies. Parents of such children found themselves stressed and disoriented in supporting their offspring to achieve their learning outcomes and enjoy a normal living style. One way out is extending their hands to occupational therapy. This paper aims to explore the possibilities of providing parents with remote guidance and support during the second wave of lockdown of Covid19 pandemic. This initial study had as objectives to (i) assess parents by the occupational therapist during the remote occupational therapy intervention session to their children with learning disabilities, (ii) provide basic remote occupational therapy training to parents, (iii) devise Standard of Procedures (SoP) to improve learning activities for children with learning disabilities and (iv) bring recommendations for this specific area of study. The research methodology was purely qualitative and conducted online through observations, session feedback forms of parents, and the therapist suggestions for improvement. The significance of this study can be adapted for other therapies namely speech and some aspects of psychological support. Initiatives for providing support to parents in such situations are expected to help in boosting the productivity of parents with regard to supporting their children, facilitating the tasks of their school teachers and constructing a better society and wellbeing of the citizens.

Evaluating the Ethical Implications of Using Chatbot Systems in Higher Education

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Abstract

Chatbot technology is rapidly evolving and being used for a variety of purposes, including education. This technology is utilized in the educational system for teaching and learning, counselling, evaluation, and research and development. Chatbots, as a technology that is increasingly infiltrating the educational sector, may have a direct impact on the lives and activities of students and faculty. As a result, an evaluation of these consequences is necessary. This paper seeks to evaluate the ethical implications of the use of Chatbots in tertiary education. A survey of 315 people was conducted. Many statistical analyses were performed on the collected data to achieve the expected results. The findings suggest that the employment of Chatbots in higher education has a practical substantial impact on users' privacy, transparency, and trust, as well as the digital gap.

Exploring the Impact of Mobile Instant Messaging on Learning: An Engineering Student Perspective

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Abstract

This paper reflects on the drawbacks of mobile instant messaging (MIM) applications (apps) when used for teaching and learning (T&L) in higher education (HE) against the backdrop of the COVID-19 pandemic. In this context, nuanced MIM T&L interventions were developed and deployed by two lecturers in the Faculty of Engineering at a University of Technology (UoT) to overcome challenges. Example of such challenges such as limited or restricted access to devices and data faced by certain students. Initial research by the authors last year deduced that MIM apps were useful, easily accessible, low-tech, low-cost/low-data usage T&L tools that widened access to education, promoted inclusivity and thereby facilitated student access, retention and success. However, the authors acknowledged some drawbacks. Thus, this study explored student perceptions on the extent to which students were adversely affected as a result of using MIM apps for T&L. A mixed method research instrument (n=69) was designed in which three research lenses suggested by Fraser (2008) were used to evaluate student perceptions of MIM apps. These lenses were (1) redistribution (of resources), (2) recognition (related to social status) and (3) representation (who can act/say/challenge) in an academic environment. Ethical clearance was sought through institutional channels. Our results indicate that despite the benefits of using the MIMs app which were reported by previous studies, specific significant barriers, such as misunderstandings and conflicts that arose directly from the use of MIM apps threaten the academic project.

Using Unplugged Activities and a Mobile App to Introduce Foundation Phase Learners to Coding

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Abstract

Within the context of the Fourth Industrial Revolution (Schwab, 2016) and the desperate shortage of software developers in South Africa (Career Junction, 2021), President Cyril Ramaphosa announced in 2019 at his SONA address, that Coding and Robotics would be introduced in all primary schools, from Grade R onwards (Lindeque, 2021). In March 2021 draft curricula were published, and currently pilot schools are being oriented regarding the curricula. A major challenge faced by the Department of Basic Education is the fact that 16000 out of the 25000 schools in South Africa do not have computer labs (Business Tech 2018). In addition to this the vast majority of teachers do not have any prior coding training or background. In 2017 Honours student Byron Batteson (2017), developed the TANKS coding game, which uses customized tokens, image recognition and a mobile app to introduce learners to coding concepts normally taught in a university introductory coding module. The fact that computers are not needed, resulted in the project reaching over 20000 learners in direct workshops, mostly from disadvantaged schools (Willemse, 2019). In order to empower schools to be able to introduce coding in class without computers, the TANKS School Kit was developed. The main feature of this kit is lesson plans (Bush, 2019; Bush, 2021) which are pen and paper activities, that complement the app. As a follow up to TANKS, the BOATS app was developed, and earlier this year the BOATS School Kit was launched. It focuses on introducing coding to learners from Grade R to 3, making extensive use of play activities that teachers can use in class, while also interacting with the app. As a pilot, BOATS School Kits were rolled out to schools across the country. During the roll out, teachers received regular Zoom training sessions on lessons, which they then needed to implement in class. The findings of this rollout will make a positive contribution towards the introduction of coding to Foundation Phase learners in South Africa.

The Fourth Industrial Revolution as a Fuel to Higher Education's Accessibility in South Africa: Challenges and Opportunities

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Abstract

This paper analyses higher educational accessibility through the elements of the Fourth Industrial Revolution (4IR) in light of the challenges and opportunities brought by the 4IR in relation to higher educational accessibility. Accordingly, the paper draws its inspiration from the current discourse on the 4IR in South Africa. Some institutions of higher learning in South Africa, i.e., Universities of Pretoria, Johannesburg and Cape Town, have always enjoyed advantages of advanced modern technology. On the other hand, the so-called disadvantaged higher educational institutions, i.e., University of Limpopo, University of Venda and Lataba College, to name a few, are currently compelled to consider the use of 4IR technologies to provide and enhance education accessibility due to the Corona Virus (COVID-19) pandemic. The advent of the pandemic revealed that there is a wide gap between advantaged and disadvantaged South African institutions of higher learning in terms of education accessibility through 4IR tools. This paper attempts to theoretically close the gap in the literature on the accessibility of disadvantaged higher educational institutions through the application of the 4IR technologies and explore the attendant challenges and opportunities thereof. The elements of the 4IR considered in this paper include, amongst others, Internet of Things (IoT) and the 5G network, which are key enablers of accessibility to higher educations. This paper foregrounds the 4IR tools because the previous industrial revolutions did not have much influence on the accessibility of higher education in disadvantaged tertiary institutions in South Africa. This paper is a conceptual intervention and adopts an eclectic literature-based methodology to analyse theoretically the accessibility of higher education, with particular interest in the challenges and opportunities of the 4IR technologies in South Africa's higher education. The paper recommends that disadvantaged higher institutions of learning should divert from the old way of teaching and integrate the "new online teaching and learning" normal so that education could be accessible.

Perceptions on an Extended Programme in Computer Science at a South African University

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Abstract

Extended curriculum programmes (ECPs) were introduced at higher education institutions in South Africa to afford students not meeting the requirements of specific programmes the opportunity to improve their skills. North-West University introduced a BSc-IT ECP in 2010 to offer more students the opportunity to obtain an academic qualification in the field of Computer Science. This paper provides background on how ECPs were established in South Africa and a brief explanation of the structure of the BSc-IT ECP that was introduced at the North-West University. A qualitative research approach was conducted to gain an understanding of the perceptions of students and lecturers on the BSc-IT ECP. Data obtained during interviews were transcribed and analysed using content analysis. Themes included students' initial versus current perceptions of the BSc-IT ECP and challenges that they experienced during their studies. Lecturers' perceptions were obtained on positive and negative aspects contributing towards the success of the BSc-IT ECP. Data revealed that students and lecturers are predominantly positive about the BSc-IT ECP which provide students who would otherwise have been excluded, the opportunity to further their studies at a higher education institution in the field of Computer Science. Furthermore, the paper reports on factors regarded by participants to contribute towards the success of the BSc-IT ECP.

Digital Interdisciplinary Collaborative Learning Spaces: Exploring the Complex and the Creative

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Abstract

With the rapid adoption of digital learning spaces, we explore the ability of such spaces to authentically facilitate collaboration in interdisciplinary student projects. We embarked on an interdisciplinary project between Information Systems (IS) and Urban Planning (URP) where students were exposed to real-world, wicked problems within South African communities. Groups were tasked with co-designing social digital innovations that encapsulate the local voice. There is limited research in our disciplines on the interplay between complexity, creativity and collaboration within digital learning environments. With the application of a sociomaterial lens, we explore the obvious and hidden benefits and challenges of digitally enhanced interdisciplinary collaborative learning. Sociomateriality allows us to disentangle the complex interactions between the social and the material. We draw from instructor and student reflections to understand how the sociomaterial qualities of digital learning can facilitate interdisciplinary collaboration. The data highlight the potential of the digital space to open up more opportunities for students to collaborate because they were not bound by the limitations of space and time. Furthermore, the use of multiple technology applications supports a constructive environment for student-directed learning. The data also revealed some challenges such as the complexity of power dynamics being subverted by the digital space in the way that student groups gloss over issues of conflict. Students remarked that they missed the embodied experiences and subtleties of in-person engagement. To counterbalance the complexities that reside in such multifaceted learning spaces, we argue in this paper for creative experimentation enabled by a sociomaterial lens.

Inclusive Software Development: A Case Study of Inclusive Practices Africa

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Abstract

This research was an interdisciplinary study investigating the role of inclusive thinking throughout the software development process. It has become increasingly clear that the current software development curriculums more often than not leaves the inclusivity component as an afterthought. Efforts are now in place across countries to counter these perpetuating effects and create a more inclusive, society-relevant education systems which meets the evolving needs of a continent developing its own identity out of a brutal history and present (Heleta, 2016). Inclusive Practices Africa (IPA)'s primary objective is therefore, to reduce social inequity caused by disability (IPA, 2019). As part of the University of Cape Town Information Systems major third year curriculum, students are required to complete a software development project based on requirements of a project sponsor, in this case IPA. This practice-based project became a "classroom" of learning – a learning environment in which students and staff are addressing real world problems of marginalisation and inequality across disciplines and offers the opportunity to engage with various role players/stakeholders. This research was based on the project conducted by five students to update the existing IPA website to a fully-functional information portal. Data was collected through observations, discussions and reflection. Early findings point to a mindset shift evident by bringing inclusivity into the development process very early on, which takes into account a wider view of requirements that is not limited to able-bodied individuals.

Moving into the post pandemic future

e/Merge Africa Team

Abstract

The COVID-19 pandemic shows no sign of ending, with one surge after another of a Greek alphabet of variants. For many of our institutions the emergency remote teaching of 2020 is giving way to systems and processes that are more planned and sustainable. We have seen impressive resilience from students and staff and we have learnt from and through this often painful crisis. We are still immersed in the dilemmas and stresses of pandemic online teaching but by the time of the digiTAL2K conference it may be easier to contemplate the possibility of life and education after the pandemic. This workshop is designed to provoke colleagues across several continents to dream, scheme and plan together for the post pandemic future. We will use a range of facilitation processes to unleash the best thinking and creativity in the room about issues such as the metaphors for our journeys through the pandemic, our learning that transfers to the post-pandemic future, structural changes needed in our institutions, how to ensure that our institutions carry forward lessons from the pandemic, and how to construct better blended lives. Much of the workshop will take place in parallel breakouts on specific questions where participants can choose which room to join.