Preface

The *Handbook of Research on Innovative Technology Integration in Higher Education* aims at providing research on the impact of information and communication technology on education and training from a scholar-practitioner perspective. All aspects of how technology is profoundly transforming education, training, and learning, including social media, e-learning, Massive Open Online Learning (MOOCS), Massive Open Online Professional informal Learning Communities (MOOPLs), Targeted Open Online Learning (TOOCs), theories, research, and practice undergirding the use of technology to engage learners and promote learning are examined. The handbook provides educators, educational leaders, corporate leaders, trainers, students, schools, parents, government agencies, for profit and non-profit organizations, universities, policymakers, regional, national and international organizations with cutting edge research on how Information and Communication Technology (ICT) is impacting education and training world over.

It is a truism that the integrated world characterized by globalization and the use of the Internet by countries world over is being driven by Ideas, Knowledge, and Technology (IKT). A country’s or an institution’s capacity to take advantage of the knowledge economy depends on how quickly it can adjust its capacity to generate and share knowledge (World Bank, 2002). Developments in technology have an extraordinary potential for transforming education to meet the growing need for customized, self-paced, and on-demand learning. “These include the convergence of computing, communication, and document management technologies and the pervasiveness of computer networks – the Internet in particular” (Hamalainen, Whinston, & Vishik, 1996, p. 284). As illustrated in this handbook, advances in technology have led to a paradigm shift in the instructional processes. The use of online instruction, and now MOOCs, especially, has made educational opportunities accessible to learners who in the past lacked opportunities due to factors such as work, geographical distance, time, family responsibilities, and lack of money (Chun & Hinton, 2001; Nafukho, Thompson, & Brooks, 2004). Computer-related course instruction has made a significant impact on the provision of instruction and student learning (Piotrowski & Vidanovich, 2000). Existing evidence shows that the use of information technology in the instruction process is spreading faster than any other form of curricula change (Gilbert, 1997). To fully comprehend the impact of ICT on education and technology research at international level is needed, hence the importance of this book.

The handbook includes pertinent research from an international perspective on the impact of Information and Communication Technology on Education and Training. The contributors of the book chapters include individuals actively involved in teaching, researching and using of technology for research, formal, and informal learning. The chapters are based on empirical data, including review of relevant literature. The contributors of the handbook recognize that the use of technology in formal, informal, non-formal, and workplace learning is more than just a passing cloud and therefore requires attention from the research community.
Preface

This handbook is divided into 20 thematic chapters. In the first chapter, Rochell R. McWhorter and Julie A. Delello examine the important issue of green computing. They observe that as technology has quickly evolved into more sophisticated forms, it is opening the options for educators and business professionals to expand learning opportunities into virtual learning spaces. In addition, the authors discuss a number of technology trends and practices that can promote green computing, as a way for organizations and individuals to be efficient in time, currency, and resources. The authors identify three technology trends that are disrupting the status quo including: cloud computing, 3D printing and the analytics associated with Big Data. Trends that appear to be taking hold include digital badges, the Internet of things, and how we are handling recycling and e-waste of our electronic devices. A discussion around issues of energy required for data servers to power the technology is also presented in this beginning chapter.

In the second chapter entitled, “Quality Preparation of Mathematics and Science Teachers to Integrate ICT: Lessons from Learner-Centered Teacher Professional Development Approach,” John Njoroge Mungai points out the emphasis of preparation of teachers to integrate ICT is gaining momentum in the education sector. He argues that underpinning this emphasis is the convergence of assertions that ICT integration has the potential to enhance the quality of teaching and learning. Nonetheless, considering that debate about effective teaching has overtaken existed between two tensions, namely learner-centered and teacher-centered approaches, the additional concern now is how best to prepare teachers to integrate ICT. Mungai notes further that the best approach is context specific and facilitates teachers’ capacity to enhance student learning through quality teaching. By reviewing Teacher Professional Development concerns in Sub-Saharan Africa, what constitutes learner-centered education about ICT integration, and depicting a case study research at ACADEMIA University in East African region about preparation of teacher educators to integrate ICT, this author advances a case about how to prepare mathematics and science teachers to integrate ICT.

The third chapter in this handbook is focused on the role of technology in improving quality of teaching in higher education from an international perspective. In this chapter, Harriet Thindwa starts from the premise that students are the future of any country. They are the leaders and entrepreneurs of tomorrow. According to Thindwa, if teaching quality is undermined, so is the country’s overall education system and therefore, so is a country’s future. Improving quality of higher education teaching implies that students graduating from these institutions will be prepared and able to compete in the job market at a national as well as global level. Quality teaching means students passing exams set by their teachers; it means receiving quality instructional material that they can use as reference in their future jobs, and it means finding quality jobs following graduation. These are also aspects that parents, who take up most of the burden of paying tuition and fees, hope for out of the academic institutions. Given the advancement in technology, institutions of higher learning world over are challenged to embrace technology as a strategy to engage students and enhance learning.

In the fourth chapter, Melissa Becker, Karen McCaleb, and Credence Baker share the use and application of free digital tools that both improve and in turn enhance the learning process in the university arena. The basic rules of student engagement are addressed and application of instructional technology applied in a best practice environment. Online and hybrid learning venues of learning are explored in the chapter with specific examples of technology application across university content areas. They observe that university recruitment websites continue to show students happily using technology in the higher education environment. They also point out that exactly how technology is used in the teaching and learning process continues to challenge and frustrate university instructors and students. A frequent depiction of college classrooms consists of an instructor lecturing from the front of the classroom and
reprimanding students for talking to each other. In this paradigm, the professor is the sage on the stage and is the single transmitter of knowledge. They question whether this teaching and learning approach is the most effective way to educate students especially in this technology dominated world. With recent discoveries about how students learn most optimally, and how technology can augment the process, a paradigm shift is required towards appropriate and intentional implementation of technology tools for engaging students to use higher-order thinking skills.

Helen Muyia and Fredrick Nafukho in Chapter 5, titled, “Keeping it Social: Transforming Workplace Learning and Development through Social Media,” note that the world is not changing, or will change, but has changed, and this change and competition in the business world today is fundamentally challenging everything about the workplace. Consequently, organizations have begun to adopt a continuous learning philosophy which has resulted in a rise in both formal and informal learning. They point out that as social media penetrates our everyday lives, organizations, educators and by extension human resource development professionals are looking at how to leverage social media tools to enhance workplace learning and development. Using such tools also fits in with current initiatives to move learning to a more employee-centered learning. The authors define social media and explores a number of social media tools that can be used to enhance workplace learning and development. Also identified in the chapter are a number of challenges associated with the use of social media for workplace learning and development. Muyia and Nafukho propose a social media-based workplace learning development framework aimed at promoting effective learning through of social media.

Norma Scagnoli, Anne McKinney, and Jill Moore-Reynen examine the important issue of Video Lectures in eLearning. It is noted in the chapter that video presentations, also referred to as mini-lectures, micro-lectures, or simply video lectures, are becoming more prominent among the strategies used in hybrid or fully online teaching. It is pointed out in this chapter that either interested in imitating a Khan Academy style of presenting content, or responding to other pedagogical or administrative needs, there are more instructors now considering the creation of short video lectures for their courses than before. The authors describe the design and application of mini-lectures in graduate and undergraduate courses, and expands on strengths, weaknesses, opportunities and challenges experienced in the development and implementation of this technique. The use of short video-lectures is a regular practice in MOOCs and has the potential of becoming a successful practice especially with the expansion of new approaches such as the flipped classroom.

In the seventh chapter, entitled “Learners’ Perception of Engagement in Online Learning,” Misha Chakraborty observes that while there is widespread popularity of online classes in both professional and academic settings, disengagement of learners is identified as a prevalent issue in online environment. Learners’ engagement and satisfaction with the online courses especially from the learners’ perspective are considered core to the promotion of quality learning. It is noted in the chapter that the voices of the present day’s “virtual generation” need to be heard. The opportunities they see, and the challenges they face can be utilized in creating engaging online learning environments. The authors explore aspects of online class engagement strategies through the findings of a study that considers learners’ perspectives in an online class. Multiple sources including semi-structured interviews with eight participants at a Research 1 University in Southwest, United States. Online course documents, email exchanges and discussion transcripts were used to collect and analyze data. The findings indicated online class engagement factors and issues that need to be considered in effective design and successful delivery of online courses. The findings can be used to help faculties and learners achieve optimum benefits from online classes.
In the eighth chapter by Nancy Hairston and Fredrick Nafukho, entitled “A Study of Trainee Attitude and Satisfaction between E-Learning Training versus Traditional Training,” the authors examine the relationship between change in attitude toward computers and overall course satisfaction of participants’ from six mid-western industries in the United States. Of the 262 randomly selected participants, 168 (64%) completed the study. Data collection instruments included: the Barsch Learning Style Inventory, Attitudes toward Computers questionnaire, and end-of-course satisfaction rating survey. Results of the paired samples t-test indicated that there was a statistically significant difference in overall course satisfaction between the e-learning group (the treatment group) and the traditional group (control group). The traditional group was more satisfied with their course than the treatment group on the general program construct and the overall course satisfaction index. Results of the t-tests indicated that overall, the e-learning group liked computers more than the traditional group prior to treatment, and remained with this attitude after treatment. The control group had a statistically significant change in attitude toward computers after the treatment to reflect a less favorable attitude toward computers after the treatment. No statistically significant difference in change of attitude was found between both groups. Results of the regression model were not statistically significant for the dependent variable, change in attitude toward computers. The variable auditory learning was statistically significant at the .05 level. The results of the regression model for participants’ overall course satisfaction were statistically significant at .05 level.

In the ninth chapter, Nahed Abdelrahman and Beverly J. Irby examine the “Perception of Faculty Members on Hybrid Learning: A Naturalistic Case Study” from the College of Education and Human Development at Texas A&M University. In this chapter, hybrid/blended learning is a method with which faculty members use both online and face-to-face teaching techniques simultaneously. The authors examined how faculty participants defined hybrid learning. In addition the participants’ thought of hybrid and online learning as vehicles for higher education advancement as well as strategies to attract more students to higher education. The main objective of this study was to develop an analytical overview of one of the learning approaches such as hybrid teaching and its effect on learning processes in the higher education. Ten professors were interviewed in order to achieve this objective. Through in depth interviews, the researchers sought perceptions of faculty regarding the definition of hybrid teaching, the difference between learning approaches with which higher education has been influenced, the opportunities and challenges with which the faculty practice while teaching using the hybrid method. The results of the study revealed that faculty members had multiple definitions of hybrid teaching as it was not only teaching using face-to-face and online platforms but rather it is a way both teachers and students could meet their needs in teaching and learning.

In the tenth chapter, “Return on Investment: Contrary to Popular Belief, MOOCs are not Free,” Marie Valentin presents information on the financial implications of the providers of MOOCs. Valentin also examines the issues of sustainability of Massive Open Online Courses. The research methods employed include a thorough review of literature published in refereed journals on MOOCs. The findings of the review of literature revealed the profitability potential for platform providers, publishers, colleges and universities, as well as test taking centers. Findings also revealed implications as to actual costs for student participants and benefits that may be assumed from participating in learning through MOOCs.

In the eleventh chapter, John LeCounte and Detra Johnson discuss the characteristics, benefits, and challenges of offering MOOCs. In this chapter, the rapid rise of Massive Open Online Courses (MOOCs) derive from a yearning to create and make widely available materials and conditions for participatory learning, and creative space dedicated to the open education. MOOCs. As noted in the chapter, MOOCs were initially developed to provide open, meaning unrestricted online courses without higher education
cost constraints to students. This new-technological platform was embraced, developed, and offered by some of the country’s leading universities and institutions including Harvard, University of Pennsylvania, Stanford, and Massachusetts Institute of Technology (MIT). LeCounte and Johnson observe that collaboration through strategic social media platforms such as LinkedIn, Facebook, and Twitter is utilized in MOOCs. In addition, the social media partnerships have been found to offer competitive advantages in terms of low cost and tremendous visibility to both corporations and institutions of higher learning offering MOOCs.

Steven Odebero, in the twelfth chapter, entitled “The Place of MOOCs in Africa’s Higher Education,” critically examines whether MOOCs would bridge the contentious issues of access to digital technology between the various social groups, the rich and the poor, the youth and the older generations including rural and urban livelihoods in Africa. The author sought to answer a central research question: What is the place of MOOCs in Africa’s higher education? A four-tier typology of MOOCs is advanced in the chapter. Underdeveloped MOOCs are presented in Low-Low Quadrant (LL), Unequal Technology MOOCs (HH), Elitist MOOCs (LH) and Accessible MOOCs (HL). The author discusses in detail the fourth typology of MOOCs with high level of development of MOOCs but with lower digital divide, which would make it accessible for thousands of students in Africa to access MOOCs. Africa was found to be lagging behind in the development of MOOCs in the world with no single MOOCs provider in the continent. The merits of investment in MOOCs included increased Gross Domestic Product (GDP) in Africa, increased women participation in education, creation of cultural independence in the continent and recruitment and marketization of African institutions of higher learning. It is noted that for Africa to enjoy these benefits, it has to surmount such challenges as high costs of design and development of MOOCs. The chapter concludes that Africa must develop her own online learning systems contingent on her own needs, practical realities and aspirations.

The thirteenth chapter, written by Jason Moats, is entitled “Influences on the Acceptance of Innovative Technologies Used in Learning Opportunities: A Theoretical Perspective.” Moats presents a theoretical framework to better understand how individuals adapt to innovative technology used to support learning opportunities. The author discusses issues pertaining to technology acceptance, theoretical perspectives of change, and adaptation of technology for learning. The concept of digital personalities and how this concept may impact technology acceptance is revisited in the chapter.

In the fourteenth chapter, entitled “Frameworks and Issues for a Shared Service Approach to Technology in Higher Education,” Judith Lewis and Yakut Gazi present the multiple frameworks and issues attendant to the shared service approach of leveraging information technology in higher education. They note in the chapter that the shared services model has been implemented in the business sector for many years, and government and higher education have more recently looked to that model in response to leaner budgets and more intense scrutiny of expenditures. Current research on shared service design is presented discussed. The shared service paradigm utilizing the frameworks of organizational structure and knowledge capital, change management, disruptive innovation theory, competitive advantage, leadership, and governance in a shared service context are discussed in the chapter.

In the fifteenth chapter, entitled “Toward An Effective Virtual Learning Environment: From a Social Presence Perspective,” Marie A. Valentin, Helen Muyia, Junhee Kim, and Celestino Valentin present an effective virtual learning model and seek to answer the research questions, What is the perception of social presence on virtual learning? What role does social presence play in student engagement in virtual learning? and, What are the social presence factors influencing the effective learning environment? The authors utilized integrative literature review technique to answer the research questions and found the
following emerging themes which are important to the field of online teaching: social presence and its
effect on student engagement, components and indicators of social presence, establishing social presence,
current state of student engagement in virtual learning environments, effective virtual learning environ-
ment components and influencing social presence in an effective virtual learning environment. Based
on these emerging themes, the authors present an Effective Virtual Learning Model as a foundational
basis for theory, research and more importantly, for practice.

In the sixteenth chapter, entitled “Integrated Multi-Agent-Based eLearning System as a Strategy to
Promote Access to Higher Education in Africa,” Geoffrey N. Omulayi and Peter Barasa Wawire present
the integrated multi-agent based eLearning system as strategy to promote access to higher education in
Africa. The authors note that integrated multi-agent-based eLearning system breaks through the traditional
barriers of time, location, and the cost of delivering educational content. In addition, they observe that the
power of the Internet in an educational context has always been that it simplifies access to content and
also contact with the experts for further clarification on that content. The authors use an agent-oriented
methodology to demonstrate how multi-agents can be used to design an eLearning system. This inte-
grated multi-agent based eLearning system brings in merits of portability, convenience, collaborative,
instant response and multi-literacy’s and provides solutions in cases where expertise is distributed all
over Africa. The authors recommend that with the rising population of Africa and scarcity of qualified
professors in higher education, the best strategy is to implement the eLearning system to help support
the learning processes in higher education institutions based in Africa.

In the seventeenth chapter, Beverly Irby, Kara Sutton, Rafael Lara-Alecio, and Fuhui Tong present
information on professional development that is virtual. They share a review of research that has been
conducted on general virtual professional development for teachers. They propose a new concept which
they have been working with in a macro federal grant which is for individual professional learning. The
concept is specifically for teachers of English language learners, but can be broadened to individual
professional learning for all teachers or teacher education students. The broad concept is termed by the
developers of the grant, Massive Open Online Professional Individual Learning (MOOPIL).

Mathew J. Berman, Kevin J. Rose, and Meera Alagaraja examine issues pertaining to asynchronicity,
access, and attainment and the best practices of an adult degree completion program for the eighteenth
chapter. The authors share the specific ways in which the Organizational Leadership and Learning Pro-
gram provides excellence in access, cost effectiveness, learning effectiveness, and faculty and student
satisfaction. The program is designed to meet the needs of adult learners with some college, but no
degree and incorporates the use of asynchronous content delivery and faculty-student interaction. The
main features of the program such as the exposure to course content via an online platform, interaction
with students and faculty online, and the development of a learning community at a distance and how
it equips students not only with content knowledge, but also with technical prowess that is necessary in
a technology-based workplace are discussed. It is argued in the chapter that despite the relative ease of
access and clear benefits of higher education, challenges still exist with educating an adult population.
The authors correctly note that it is essential that more adult friendly practices (prior learning assessment,
convenient course options, and evening and online student support) become integrated into the fabric of
traditional four-year colleges and universities. If programs are able to manage the demands of students
that identify as worker, spouse or partner, parent, caregiver, and community member with timely and
informed feedback and guidance, higher levels of student persistence is sure to follow.
Celestino Valentin examines the issue of Massive Open Online Courses and the global digital divide for the nineteenth chapter. The purpose of this chapter is to help address the question of global digital divide and provide the readers with scholarly information to help them reach their own conclusions, and answer to the question, Is there really a MOOC global digital divide gap or is it just a myth? The method used included a critical review of the literature and a non-traditional open approach to research which included utilization of websites, blogs, MOOCs website articles, peer reviewed scholarly journals, books and platform website information. Findings include total number of MOOC users, platform providers, and countries involved.

In Chapter 20, Melissa Layne and Phil Ice explore how digital scholarship, teaching, and learning is dramatically changing the educational landscape. They correctly observe that new pedagogies and philosophies in the area of digital publishing vis-à-vis technological advancements are being examined through a different lens – one in which obliges scholars to reimagine and restructure scholarship in ways never before conceptualized. Layne and Ice point out that despite the expeditious need to transform current traditional models of scholarship, scholars and publishers alike have been surprisingly sluggish to do so, hence the need for innovations in integrating technology into higher education. The authors suggest contemporary and future pathways for change in the areas of accessibility, the need for academe to follow magazine publishers’ lead for reimagining the digitization of scholarly work, and to include analytics in publication. In their conclusions, they reiterate that although new methods of communication will yield new methods of how our society is organized, the essence of scholarship with what remains constant is that academics will continue to converse, address a problem with supporting evidence, and disseminate findings to others. Digital scholarship must support all of these tasks if it is to merge or even replace traditional scholarship and adhere to the mission of education alongside present-day opportunities.

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REFERENCES


Preface


