Chapter 19
Informatics Education Enhanced by Problem-Based Learning Model via E-Learning:
Experience From BSU Project at SUA

Camilius Sanga
Sokoine University of Agriculture (SUA), Tanzania

Daniel Wilson Ndyetabula
Sokoine University of Agriculture (SUA), Tanzania & Aalborg University (AAU), Denmark

Sotco Claudius Komba
Sokoine University of Agriculture, Tanzania

Safari Mafu
Sokoine University of Agriculture, Tanzania

ABSTRACT

This book chapter presents an assessment of the implementation of a blended approach (Problem Based Learning and E-learning) in teaching Research Methods for Computing and Information Management course to Informatics students at Sokoine University of Agriculture, in Tanzania. The respondents comprised of 55 students and 10 instructors from the Department of Informatics. The students were taught Research Methods for Computing and Information Management course for 16 weeks using Problem Based Learning and E-learning principles. The results revealed that the use of Problem Based Learning enabled students to develop problem solving and critical thinking skills. Also, it was revealed that, in spite of the benefits of Problem Based Learning and E-learning in improving student-student and student-teacher interactions, the implementation of Problem Based Learning and E-learning in teaching Research Methods for Computing and Information Management course faced a number of contextual and infrastructural challenges such as lack of adequate Information and Communication Technology infrastructure, lack of external support, low Internet bandwidth, inadequate number of computers, lack of knowledge on E-learning and Problem Based Learning by facilitators, and lack of a unified policy for blending approach for teaching and learning different courses in most Higher Learning Institutions of developing countries. This book chapter recommends the adoption of flipped classroom instructional strategy in which Problem Based Learning and E-learning are used to promote student participation during the process of teaching and learning.

BACKGROUND

Problem-Based Learning (PBL) is a curriculum development and delivery system that recognizes the need to develop problem solving skills (Thomas, 2000). In PBL, the main emphasis is on helping students to acquire knowledge, skills and competences through 'learn-by-doing' instructional approaches in which the learners solve both simulated and real life problems. PBL is an instructional approach that has a potential to motivate students to develop flexible understandings and lifelong learning skills. According to Schmidt (1983), PBL provides an environment in which students can draw upon prior knowledge, learn within the real world context and reinforce the knowledge through independent and small group work. In the same light, MacDonald and Issacs (2001) emphasize that PBL focuses more on what students do rather than what the instructor does (i.e. learn by doing). Thus, PBL focuses on learner experience, participant control, learner self-management and self-guidance. When PBL is used as an instructional approach, students learn by solving real life problems and reflect on their experience (Barrow & Tamblyn, 1980). Proponents of contemporary active learning theory assert that PBL is a robust method especially when it is applied in combination with e–learning (Walker & Leary, 2009).

E-learning on the other hand is an education delivery method based on modern method of communication, including the computer and its network with various audio-visual materials, search engines, electronic libraries and websites (Sife, Lwoga, & Sanga, 2007). Generally, this type of education is delivered through the medium of the World Wide Web (WWW) where education institutions develop their programmes and learning materials are available online. Students are able to access the learning materials and interact with authority persons (i.e. instructors or teachers or facilitators) in the institutions through closed or shared networks or the Internet or Intranet or Extranet and also through the use of e-mail and online discussions. The concept of e-education refers to:

The use of Information and Communication Technology (ICTs) to enhance or support learning in tertiary education (OECD, 2005, p.11).

Thus, accessibility, usability and affordability of ICT by many citizens have spearheaded the implementation of E-learning worldwide. This has consequently led to the improvement of education as both teachers and students learn through Internet. However, in the 1990s majority of teachers were not using E-learning in their teaching due to high costs involved in constructing infrastructures and accessing the Internet (Kean, 2008). Apparently, with the recent developments in ICT, the cost of accessing Internet through mobile phones has become affordable for most stakeholders of Higher Education in developing countries, including Tanzania.

Rosenberg (2001) observes that since E-learning is networked, it is capable of instant updating, storage/retrieval, distribution and sharing of instruction or information. E-learning is the Internet technology which enhances knowledge sharing either between students and teachers and it offers learners with control over content, learning sequence, pace of learning, time and media (i.e. personalized learning). Thus, E-learning allows learning to be tailored as per experiences of learners to meet their personal learning objectives. In order to activate the learner to solve problem there is a need to use PBL via E-learning.

PBL is suited in helping students become more active learners because it situates learning in real world problems and makes students responsible for their learning. Many educators are interested in PBL because it emphasizes on active transferable learning and motivation of students, as it is opposed to face-to-face learning (Kay et al., 2000). In PBL, students work in small collaborative groups and learn

23 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/informatics-education-enhanced-by-problem-based-learning-model-via-e-learning/191674

Related Content

Effect of Computer Assisted Instructional Package on Students' Learning Outcomes in Basic Science
Simeon O. Olajideand Francisca O. Aladejana (2019). *International Journal of Technology-Enabled Student Support Services (pp. 1-15).*
www.irma-international.org/article/effect-of-computer-assisted-instructional-package-on-students-learning-outcomes-in-basic-science/236071

The Relationship of Classroom Behavior and Income Inequality to Literacy in Early Childhood
Ross Glen Chandler Nunamakerand William Arthur Mosier (2023). *Research Anthology on Early Childhood Development and School Transition in the Digital Era (pp. 698-726).*
www.irma-international.org/chapter/the-relationship-of-classroom-behavior-and-income-inequality-to-literacy-in-early-childhood/315706

Edu-ACoCM: Automatic Co-existing Concept Mining from Educational Content
Maitri Maulik Jhaveriand Jyoti Pareek (2019). *International Journal of Technology-Enabled Student Support Services (pp. 16-40).*
www.irma-international.org/article/edu-acocm/236072

Retention of Online Learners: The Importance of Support Services
Pamela A. Lemoine, Gina Sheeks, Robert E. Wallerand Michael D. Richardson (2019). *International Journal of Technology-Enabled Student Support Services (pp. 28-38).*
www.irma-international.org/article/retention-of-online-learners/244209

Public Policy Reforms: A Scholarly Perspective on Education 5.0 Primary and Secondary Education in Zimbabwe
Cleophas Gwakwaraand Eric Blanco Niyitunga (2024). *International Journal of Technology-Enhanced Education (pp. 1-18).*
www.irma-international.org/article/public-policy-reforms/338364