Chapter 51
Using Blended Learning Approach to Deliver Courses in an Engineering Programme

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ABSTRACT

The paper discusses how the use of blended learning approach was adopted to deliver a 3rd year Mechanics of Machines course for Mechanical Engineering students at the University of Botswana. The course delivery involved a mix of both face-to-face and Blackboard technology to create an efficient and effective learning environment. A survey of 101 students was conducted over a period of 3 years for the respondents to evaluate their teaching and learning preferences. The results show that students accepted the blended learning approach because of its benefits. More lecturers are encouraged to use blended learning and teaching approaches to promote active, independent and lifelong learning.

INTRODUCTION

Engineering disciplines continuously change and expand into new practice areas. Consequently educators are constantly challenged to revise the curriculum as well as the modality for its delivery. The introduction of information communication technology (ICT) in education has encouraged fundamental shifts in teaching and learning methodologies. Lecturers are challenged to meet the expectations of Net Generation students and also offer quality learning experiences and outcomes. Evidence from the literature shows that the traditional face-to-face approach of teaching and learning where knowledge and skills transfer were achieved through lecturing alone has some deficiencies (Hoic-Bozic, 2009). Therefore, there is a

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paradigm shift in the educational system from an educator-centered to learner-centered approach which promotes active, independent, and lifelong learning taking place in a collaborative learning environment. Such an environment stimulates knowledge building, sharing and distribution because cooperation among learners has an important influence on the learning outcomes (Hoic-Bozic, 2009). There is a research gap studying the perceptions of learners subjected to modern pedagogies. It is against this background that this study focuses on students' preferences, of course delivery. It is envisioned that this work will enhance both innovation in curriculum design and course delivery options. The three succinct objectives of this study were to:

- Evaluate the learning experiences of the Mechanical Engineering students who used Blackboard technology at the University of Botswana.
- Assess students' preferences in terms of methods of course delivery.
- Determine the effectiveness and benefits of Blackboard technology on students learning.

BLENDED LEARNING

In order to achieve this shift in pedagogy, from lecturer-centered to learner-centered methodology, institutions of higher education have embraced the blended (hybrid) learning approach depicted in Figure 1.

Blended learning involves employing a variety of multimedia technologies for teaching methods, learning styles and most often a mix of face-to-face and e-learning, with the aim of each mode complementing the other and creating the most efficient learning environment. Bath and Bourke (2010) argue that blended learning achieves better student experiences and outcomes, and more efficient teaching and course management practices. According to Krause (2007), blended learning is possible in educational environments where there is an effective integration of different modes of delivery, models of teaching and styles of learning as a result of adopting a strategic and systematic approach of the use of technology combined with the best features of face to face interaction. Developments in ICT have provided

Figure 1. Blended learning approach