Chapter 4
Critical Issues in Evaluating Education Technology

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EXECUTIVE SUMMARY

This chapter highlights some issues that are critical in evaluating technology in education such that it will be implemented to meet educational goals and it will also serve as a spotlight for policy makers and educators to make a worthwhile return on their technology investment. Schools and institutions of learning invest heavily on technology before establishing clear plans on how it will be integrated into teaching and learning to achieve educational goals. Even though many studies have reported positive impact of technology on students' learning yet; not much of studies have been carried out to investigate whether the investment on technology in schools have been commensurate with the investment. Particularly needs assessment on both students and teachers' technology needs is often ignored before technology implementation. Educators and policy makers need to consider certain evaluation issues before committing huge budgets into technology. It is crucial to ask what can technology do that cannot be done without it, what percentage of the institution's budget should be invested on technology, how should technology be integrated in the curriculum to achieve educational goals and lots more before investing on educational technology to avoid resource wastage. Thus, this chapter highlights these critical issues in the light of a study conducted on the integration of information and communication technology (ICT) in the teaching and learning of science and mathematics in Malaysian secondary school (Adedokun, 2008). The research investigated some concerns that culminated from the integration of ICT in the instruction of English, mathematics and science in Malaysia among which are: Can the teachers deliver? Do they have the strong will to deliver? Are there adequate facilities for them to carry out this new task? Do they possess the necessary skills for them to be able to deliver? Does the government provide adequate training on the integration of ICT in subject content? Are the students prepared for the change in the medium of instruction? What is the present situation in schools with regards to the use of ICT? And is better teaching and learning achieved with the integration of ICT?

INTRODUCTION

Technology in Education is seen as a tool for achieving instructional goals, not a goal in itself. Yet, many institutions are putting the cart before the horse by investing in educational technology before establishing clear plans on how to deploy it. Education technology is not just an ornament for school design, but an important component of the curriculum. Education researchers (QED, 2004) have observed that government and institutions are expending huge sum of money on technology in education as an indication of development and improvement in schools. However, studies observed that these funds will amount to wastage if not properly expended. Thus, policy makers and educational administrators need insight into how to deploy the technology expenditures and maximize its positive impact on education.

Educational technology has greatly impacted on teaching and learning and grossly increased improvement on students' achievement. Internet technology helps students become independent, critical thinkers, able to find information, organize and evaluate it, and then effectively express their new knowledge and ideas in compelling ways.

Similarly, technology acts as a catalyst for fundamental change in the way students learn and teachers teach, and it revolutionizes the traditional methods of teaching and learning. Educational technology has a significant positive impact on achievements in subject areas, across all levels of school, and in regular classrooms as well as those for special-needs students. Most of these reported effects of technology integration occur with peculiar conditions that worked in those situations and may not necessarily result in positive effect in other situations if the right conditions are not in place. Issues like teacher readiness, training, student attitude and access to proper technology infrastructure are the right conditions for successful technology integration.

In like manners, the onus of the positive acknowledgements in education does not go to technology alone. The extent of this effectiveness is influenced by several other factors such as; the instructional design, the teacher's role, the student population, students grouping, and the levels of student access to technology. Adedokun & Hashim, (2008) reported that teachers believed that ICT can only be useful when complemented with other instructional materials. This indicates that technology alone cannot do the trick but with an interconnected system in place and a judicious use of technology in teaching and learning.

THE CASE STUDY

Malaysia identifies ICT as one of the most important factors in achieving the aims of Education Development thus; ICT was integrated in secondary schools across the country especially in the teaching of English, Science and Mathematics (Ministry of Education, 2004). This swift change in the Malaysian Education policy raised several concerns from the teachers, parents, students and other concerned stakeholders. Hence, studies on the success of the policy, the policy implementation process, teachers' and students' perception of the policy and many other relevant issues become prominent. This study under discourse in this chapter (Adedokun, 2008) investigate the teachers' and students' perception on the ICT integration in the teaching and learning of science and mathematics with respect to its use, ease of use, adequacy, problems encountered and students' learning. A mixed method approach was devised to gather comprehensive data for the study. A 20-item questionnaire was designed to analyze students' perception of the use of ICT in the teaching and learning of both science and mathematics.

Similarly, a 20-item interview question was developed to examine the perception of science and mathematics teachers on ICT integration in their respective subjects. Lastly, two science classes and one mathematics class were observed and video-recorded to triangulate and validate

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