Chapter 100

The Cost–Effect Analysis of Integration of CSIEC System into English Instruction

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ABSTRACT

This chapter introduces the concept of educational efficiency and its calculating formula to describe the effect, cost, and duration of an educational system composing learners, teachers, and learning content and instructional approaches. Then the formula is used to compare the cost-effectiveness of the blended learning with CSIEC system and that of the traditional teaching and learning approach. Given the fact that the intelligence improvement with CSIEC system is greater than that with the traditional approach and the performance-price ratio of the latest computer and Internet access is increased much, the cost-effectiveness with CSIEC system is much greater than that with the traditional approach. International comparison shows that the effectiveness-cost ratio in the case of blended learning with CSIEC is higher, and the feasibility analysis suggests a cost-effective way to make full use of the investment in education to improve the students' learning performances.

INTRODUCTION

The vast amount of empirical studies about the information and communication technology including the CSIEC system introduced in the previous chapters have demonstrated the positive effect of ICT, and especially the intelligent tutoring systems, on the students' learning performance by foreign language learning. However, besides the effectiveness, the cost of ICT should be paid attention to, and be concerned with for ICT's economic and social implication. In this chapter the author will analyze the cost-effect relationship of ICT application in education with the example of CSIEC system integrated in the teaching of English as a foreign language in middle schools in Chinese background determining the infrastructure, human resource and equipment cost.

LITERATURE REVIEW

The lawmakers, social media, taxpayers and educational administrators doubt about the genuine impact of computer on education with huge cost. For example, *New York Times* on September 3, 2011, reported with the title "*Grading the Digital School: In Classroom of Future, Stagnant Scores*" the situation of massive technology investment leading to zero test score rise as the following.

Classrooms are decked out with laptops, big interactive screens and software that drill students on every basic subject. Under a ballot initiative approved in 2005, the district has invested roughly $33 million in such technologies…Hope and enthusiasm are soaring here. But not test scores…Since 2005, scores in reading and math have stagnated in Kyrene, even as statewide scores have risen…In a nutshell: schools are spending billions on technology, even as they cut budgets and lay off teachers, with little proof that this approach is improving basic learning.

Some backers of this idea say standardized tests, the most widely used measure of student performance, don't capture the breadth of skills that computers can help develop. But they also concede that for now there is no better way to gauge the educational value of expensive technology investments.

The lawmakers, social media, taxpayers and educational administrators are concerning the higher investment in computer and information technologies, including all the hardware, software and maintenance cost, and the time spent on learning the technology, preparing and organizing the classroom course, than the cost with the traditional pedagogical approaches, for example, the simple usage of chalks and blackboards, and paper-based assignment and examinations. If someday the educational technology could be more easily and more conveniently used by the teachers than iPad, and the students could achieve better grades in the school tests, the information and communication technology would really reform or even revolutionize education.

Therefore the practical and reliable examples, rather than the businessmen's propaganda or researchers' sound educational theories, would convince the teachers and school administrators to use computer and emerging technologies in classrooms, and the law-makers and the government to invest more on the hardware and software for educational technology. This kind of practical examples should not be just the specially designed and short-term usage of information and communication technology, for instance, several times or several hours, but the long-term integration of technology in normal school settings.

Economic benefits of corporate e-Learning have been investigated by researchers from management sectors. Hall and LeCavalier (2000) summarized some corporates' economic savings as a result of transforming their traditional training approaches to e-learning: in 1999, IBM saved US $200 million, providing five times the learning at one-third the cost of their previous methods. Using a mixture of 80% web-based and 20% classroom instruction, Ernst and Young reduced training costs by 35% while improving consistency and scalability; Rockwell Collins reduced training expenditures by 40% with only a 25% conversion rate to Web-based training. Strother (2002) analyzed the cost-effect of e-learning in corporate training programs, and stated that e-language-learning in business is a win-win proposition for all: the learner, the corporation, and the customers served by the corporation.

Educational technology is often cited as an approach to improve educational outcomes and reduce costs, leading to greater quality and efficiency in learning and instruction. Yet research that attempts to assess the costs and benefits of educational technology is limited, making it difficult for educators and

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