Chapter 11
An Analysis of the Research and Impact of ICT in Education in Developing Country Contexts

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ABSTRACT

Rigorous evaluations on the impact of information and communication technologies (ICTs) on learning outcomes in developing countries is sparse and often lacks the methodological quality necessary to guide policymakers towards sound, evidence-based practices. This desk study reviews research undertaken to date on the impact of ICTs on learning outcomes in developing countries. First, a series of in-depth, structured interviews with a range of stakeholders, including policymakers and academicians, researchers, users and developers of ICTs, was conducted, followed by a global literature review of published and unpublished evaluations on the educational impacts of ICTs. This study found that while qualitative studies often highlight the benefits of ICTs for learners and other stakeholders, there is little rigorous research to support a causal linkage between student learning outcomes and ICTs in the developing world. This study concludes that decision makers in developing countries are guided not by evidence or data but by intuition and other influences when choosing to invest in technology in an effort to upgrade the quality of instruction in their schools. Finally, recommendations for future evaluations are offered while considering important lessons learned from extant research.

INTRODUCTION

Globalization and rapid technological change have made knowledge a critical determinant of competitiveness in the world economy. Within less-developed countries in particular, it is becoming increasingly important for local leaders and national policymakers to use innovative information and communication technologies (ICTs) to

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develop a more sophisticated labor force, manage administrative information systems and contribute to national strategies to reduce poverty and other social issues (Pringle & Subramanian, 2004). ICT is an umbrella term that includes all technologies that manipulate and transmit information, such as radios, cellular phones, and computer hardware and software, in addition to the services and applications associated with them, such as video conferencing or distance learning (European Commission, 2001). Within the education sector, the importance of ICT lies in its potential to increase access to knowledge and services and to improve the quality of instruction for marginalized or traditionally underserved populations.

ICTs are often anecdotally associated with improvements in quality of classroom instruction, provision of innovative instructional opportunities for teachers and students, and improvements to capacity at the administrative or policy level (H. Tahar, personal communication, September 9, 2008; R. Karmacharya, personal communication, August 28, 2008). There is a sense of positive impact among practitioners, but upon closer inspection there is an absence of rigorous research to support this "positive feeling" (Trucano, 2005; Wagner et al., 2004; Wagner et al., 2005). Further, governments in developing countries (i.e. Ministries of Education) sometimes find themselves in "situations where there is pressure to acquire and adopt new technologies because of the claims of what these technologies could do to aid and leapfrog their development" (Hooker, 2008, p. 3). The hope among these practitioners is that by merely updating materials and resources, an upgraded quality of instruction will result. However, these decisions are made without a comprehensive evidence base that is grounded in rigorous evaluation methodologies. It is therefore an impossible task to estimate "the potential and reach of ICTs" and to understand the contexts in which they succeed or fail (Hooker, 2008, p. 3). In the absence of experiments in particular, such as randomized controlled trials (RCTs), it is easy to persist in the notion that ICTs are "a magic bullet that will provide the answer to long standing educational challenges" (Derbyshire, 2003, p. 42; see also Bakia, 2001). Further, there is the danger that "technologies introduced into environments characterized by social and economic inequality tend to reinforce and even exacerbate" those inequalities, highlighting the need for incontrovertible evidence on the impacts of ICTs on student learning outcomes if accurate and reliable decisions are expected from policymakers and practitioners (Derbyshire, 2003, p. 42; see also Wagner et al., 2004; Wagner et al., 2005).

The purpose of this chapter is to examine what conclusive research has been conducted to determine the impact that ICT in education has had on student learning in developing country contexts. The current evidence base assessing the impacts of ICTs on student learning outcomes in developing countries consists primarily of qualitative studies. Very few true experiments, where participants are randomly assigned to receive an intervention, have been conducted in this arena, leaving unanswered important questions regarding the educational benefits of ICT interventions on beneficiaries. Extensive descriptive information on and evaluations of projects incorporating ICTs in educational settings in advanced economies (and even some developing countries) does exist. However, the context for studies in North America and Europe is very different from the social, economic and cultural realities often found within communities in developing countries. For example, the goals of and resources available to implementers in less-developed countries may differ significantly from goals and resources available to implementers in developed countries. In addition, the challenges associated with implementation of ICT interventions, such as physical infrastructure and telecommunication, will differ widely across and even within countries, especially when comparing developed and developing countries (Derbyshire, 2003; D. Silvernail, personal communication, August 25, 2008). In order to develop and refine