

A Comprehensive GeSCI Meta-Review of Research in ICT4E: Phase 2 (summary)

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Note: the full documentation of the GESCI Meta Review Phases 1 and 2 can be found at
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Introduction

This session addresses the second phase (P2) results of a comprehensive educational ICT4E research and practice meta-review commissioned by GeSCI. Earlier in 2009, an initial phase (P1) report offered a synopsis of research related to GeSCI’s five thematic priorities:

1. Educational ICT leadership and management
2. ICT infrastructure, connectivity, and accessibility
3. Integration of ICTs into teaching and learning
4. Teacher education and ICT
5. Educational Content and ICT

Research was limited to studies conducted between 2006 and 2009. P1 studies included work from a variety of resource types. While the researchers reviewed approximately 250 studies related to the identified themes, many times that number were published during the specified time frame.

P1 background

The purpose the Phase One research was to provide a multi-disciplinary, multi-methodological lens for understanding the complexity and exponential growth of ICT around the world. As distinct from P2, the initial phase of analysis included documents not only from traditional peer-reviewed literature but also selected items from “grey literature,” such as policy reports, conference proceedings, technical papers, and news releases from the popular media. Although the scope of the search was limited to five thematic streams outlined in GeSCI’s original Terms of Reference, the comprehensive nature of those themes dictated a search methodology that was both focused and far-reaching.

Study refinements for P2

The Phase 2 narrative anchors this eLearning Africa 2010 presentation. Expanding on the P1 Report, P2 responded to several refined GeSCI declarations of purpose and mission. A tighter journal quality screen was adopted for P2. Reviewed studies were gathered from a limited number of the most highly-rated educational journals appearing from 2006 to 2009. The researchers focused on the following sub-themes:

1. Leadership and management promoting effective ICT deployment
2. Transformational migration to a new century
3. Equity of access to the resources of technology

Each of these themes was examined to answer the following questions:

1. What are the major research trends?
2. What works and what does not?
3. How should resources be organized and deployed?
4. What further research is needed to advance effective deployment and "best practice"?

Using this approach, the researchers intended to examine a considerably smaller number of research studies in greater depth than for P1.

P2 methodology

Published scholarship in ICT is prolific. While the researchers reviewed approximately 250 studies related to the identified themes, many times that number have been published between 2006 and 2009. The better to understand how this emergent field is being defined by the academic community, a tight journal quality screen has been adopted. Studies are reported from a selection of the highest-rated educational journals. To better understand how the emerging field of ICT in education is being defined by the academic community at-large, the scope of the study is not limited to ICT journals but includes a broader sweep of the education literature. The *Publishing in Academic Journals in Education* (PAJE) database project (Holbrook et al., 2009), developed by the Centre for the Study of Research Training and Impact (SORTI) at the University of Newcastle, Australia, was selected as an appropriate journal quality measure for the purposes of this project.

For P1, a comprehensive literature review had been extracted from recent publication. A tightly-structured, controlled vocabulary search of Educational Resources Information Center (ERIC) was undertaken. Since P2 targeted a select list of journals, research could focus individually on each journal. Whenever possible, individual journals were searched by keyword. Otherwise, the tables of contents for the time frame under study were reviewed. Many entries were generated, requiring scholarly judgment to select studies appropriate to P2.

P2 findings summary

Overview. Two unexpected outcomes emerged from the P2 review: first, more studies were published than anticipated (N=253); second, the greater portion of those studies was published in ICT journals, with surprisingly few results published in other sub-disciplines. When educational literature is broadly considered, therefore, ICT researchers may be talking largely

among themselves. ICT research seems to remain an emerging field, still failing to pierce the conversational mainstream of educational policy and practice.

Leadership. Several studies address the unrealized promise of ICT to transform the fundamental nature of schooling. Contemporary schools world-wide appear to be structured on a hierarchical industrial model. When technology is simply layered onto a traditional framework, its potential is severely constrained. Educational leaders are therefore challenged to examine the larger educational structure before considering the particulars of improvement through technology. Technology cannot be "disruptive" in a transformational sense if the curriculum driving it is not itself disrupted.

Since schools perform the double-duty of curriculum and social supervision, the contribution of the local school principal to constructive innovation is repeatedly stressed, as is the necessity of deep, continuing communication among all levels of policy jurisdiction. Educational leadership is urged to assure the provision of resources so that educators may pursue innovation in sensible and safe settings. This suggests that vision-driven professional development, persistent communication, material resources, and ongoing research are critical to the success of ICT-rich transformation.

The importance of initial teacher education is stressed, not only equipping prospective teachers with technological skill but also instilling confidence and habits for transfer into the profession. The literature offers a broad variety of innovative techniques to improve teacher education and to make it relevant to a technologically-networked world. As for the efficacy of ubiquitous computing, research stresses the importance of sound educational planning to realize the benefits of massive, personal computer infusion.

Transformation. Several metaphors for transformational resistance are offered. The "grammar of schooling" is a term describing entrenched practice. Thus, educational leaders need to create the "disruption" mentioned above in order to change the grammatical rules. In doing so, regional cultures need to be understood and respected. In certain regions, resource distribution priorities in wealthy countries seem bizarre in regions where basic sustenance for survival is scarce. The ubiquitous distribution of \$200 laptops, for example, makes little sense where \$200 represents an average citizen's monthly -- or even annual -- income.

The well-worn factory model of schooling lends itself to the tradition of instruction “delivered” to learners. Contemporary learning research, however, shows that lasting knowledge is “constructed” by learners based on the quality of interaction with people and materials in their environments. ICT offers many affordances for the effective creation of constructivist learning environments. The research reported in the main body of this report points to specific strategies for doing so.

Throughout the world, perpetual mobile connectivity is becoming commonplace. With 3-G telephony, young people are linked to a kaleidoscopic global universe everywhere and all the time. New Web-based tools promoting virtual representation, shared workspace, social networking, and round-the-clock public chatter constitute standard social practice for today’s youth. If schooling fails to respond, then the technological revolution will alter the fundamental shape of education willy-nilly, inevitably and aimlessly.

Equity. This research addresses the question of equity two distinct contexts: equity related to gender, race, ethnicity and nationality; and equity related to special learner need and socioeconomic status (SES). In the developed world, ICT resource disparities between the genders appear superficially to be waning. Nevertheless, enabled by computer networks, cyber-bullying among schoolchildren seems to be spiralling out of control. Wherever cyber-bullying occurs, boys tend to be the perpetrators and girls, the victims.

In some cultures, gender disparities exist. In Greece, high school boys are found to be more facile with computers than their female peers. Disparate levels of technological confidence seemed to be associated with scholarly achievement. Some researchers found that inequities can be reduced through creative application of ICT-embedded teaching strategies such as gaming, role-playing, peer coaching or adult mentoring. Classroom strategies vary in their relative effectiveness for boys versus girls. Inequities across and within national boundaries are revealed on the basis of relative affluence and SES.

Discussion about the equitable distribution of ICT resources has historically stressed comparative machine counts, masking a more meaningful narrative. Rather than analyzing computer-to-student ratios, researchers might better examine actual classrooms conditions. In the context of transformational curricular vision, research needs to examine what is being

accomplished with the counted machines; their condition, their software support, and professional development for teachers who are expected to implement ICT-based methods effectively.

Presentation summary

This P2 review provides a snapshot of ICT dialog occurring in, or absent from, the educational literature. Complementing the themes of interest in this study, the review uncovers significant ICT research gaps, revealing a discussion taking place in narrower scholarly and professional circles than previously thought. Although both phases of the research described here is drawn from the broader ICT4E field, they were commissioned to provide a solid research base for policy and practice in the developing world. Participants at this presentation are invited to a collective consideration of the implications of this research for their local circumstances.

The complete Phase 1 and Phase 2 products of this meta-review may be accessed at:
<http://www.gesci.org/publications.html>.

Acknowledgment

The authors acknowledge the extensive guidance and support of GeSCI and its expert staff.

Reference

Holbrook, A., et al. (2009). *Publishing in academic journals in education*. Available from
<http://www.newcastle.edu.au/research-centre/sorti/paje/>.