DISTANCE EDUCATION FOR TEACHER TRAINING:

Modes, Models, and Methods

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Section I. Chapter 1

PRINT-BASED DISTANCE EDUCATION

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Print-based distance education courses have proven to be the least expensive—and sometimes the only feasible—modes of teacher training.

1.1 Overview

Print-based correspondence courses are the oldest existing mode of distance education. Globally, print or text in one format or another is still the most prevalent form of upgrading the skills of unqualified or underqualified teachers, most notably in Sub-Saharan Africa and South Asia. Print-based distance education courses have proven to be the least expensive—and sometimes the only feasible—modes of teacher training in countries with difficult terrain, poor technology infrastructure, highly dispersed or difficult-to-reach populations, and little budget, equipment, and human capacity for more multimodal means of distance learning.

1.1.1 Print versus Text

Because of advances in technology, this chapter distinguishes between *print* and *text. Print* in this chapter is defined as the process used to reproduce text onto paper. It refers exclusively to the paper-based format in which text appears—books, newspapers, guides, magazines, or any other printed publication. *Text* in this chapter refers to written information that is not paper-based but is available digitally (e.g., a *Word* file included in an online course) or is electronically-based (such as written information displayed in a TV program). As an example, if the reader prints this chapter to read it, this is a print-based resource. If he or she reads it on a screen, it is text-based.[1]

1.2 Examples of Print-based Distance Learning for Upgrading Teachers' Qualifications

It may be natural to assume that in a hyper-connected world, print is dead. But during COVID-19 pandemic school lockdowns, printed learning packages emerged as a major form of continuing education for many of the world's learners. Print and text-based learning remain major media for teacher professional development, particularly for upgrading of in-service teachers' basic content and pedagogical skills. For example, the multi-year program, Teacher Education in Sub-Saharan Africa (TESSA), uses largely text-based materials. In Namibia—a large, rural, and sparsely-populated country—print–based materials remain the main distance education mode of delivery at The Namibian College of Open Learning (NAMCOL), which prepares many of Namibia's teachers (C.P. Beukes-Amiss, personal communication, April 7, 2022).

As suggested by the examples above, Sub-Saharan Africa has traditionally provided numerous models of print-based teacher education. The remainder of this chapter shares examples of large-scale print-based distance education for teacher professional development, much of it in Sub-Saharan Africa.

[1] In the first of many cases highlighting the increasing convergence of distance modalities, and the editorial executive decisions this spawns, phone-based texting will be examined in *Chapter 6: Mobile Technologies.*

1.2.1 Ghana: Untrained Teachers' Diploma in Basic Education (UTDBE)

In the early 2000s, Ghana's successful implementation of Free Compulsory Universal Basic Education (FCUBE) spawned a shortage of qualified primary school teachers, with colleges of education unable to produce enough qualified teachers to meet demand. In response, in 2003, the Teacher Education Division (TED) of Ghana Education Services (GES) launched the Untrained Teachers' Diploma in Basic Education (UTDBE) program to upgrade thousands of unqualified teachers (Graham & Owusu, 2018). UTDBE mailed textbooks and study guides to these teachers as part of its efforts to prepare them for a diploma in basic education.

The UTDBE program used the same curriculum as the formal three-year pre-service program—a Diploma in Basic Education (DBE)—but over a four-year period in order to keep teachers in school. Using the curriculum study guide/syllabus, teachers read their textbooks, completed worksheets and quizzes, and mailed them to their tutors at the nearest teacher training college. Each summer, they met in-person with their regional colleagues and tutors for a month-long summer residential session that focused on instruction. Once they completed this course of study, untrained teachers sat for a national teaching exam, following which, if successful, they received an actual teaching diploma. Evaluation results were generally positive, showing that teachers trained under the UTDBE program had comparable skillsets, and in some cases higher average scores, than those participating in the formal DBE program, and that the UTDBE program was more cost-effective than the DBE program (Associates for Change, 2016; Graham & Owusu, 2018).

1.2.2 Guatemala: Threshold for Teacher Change

Where print is the primary source of instruction, support is often furnished through other media. In Guatemala, the Millennium Challenge Corporation's (MCC) *Threshold for Teacher Change* program (2015–2021) supported the upgrading of qualifications of over 1,900 lower secondary school teachers in five Guatemalan departments. Each Saturday, teachers traveled to various university campuses throughout the Guatemalan highlands for daylong face-to-face workshops with university instructors to learn new content and pedagogical approaches. They returned home to study their paper-based study materials, *I Learn and Teach*, over 40,000 copies of which were printed and delivered to support teachers, university professors, and professionals from the Ministry of Education's Department Directorates. These print-based materials were eventually supplemented by a teacher-resource website and tablets so that a select group of teachers could continue with online learning (Millennium Challenge Corporation, n.d.).[2]

1.3 Supporting Teachers through Scripted Teaching

Scripted teaching is one of the most common manifestations of print-based instruction. This involves furnishing teachers with scripts, either paper-based or on tablets, which they repeat *verbatim* to their students. Scripted lessons may include prompts about when to walk around the room or ask a question, as well as time allotments for each lesson segment. Scripted teaching is common in many regions of the globe—for example, *Success for All* is a well-known scripted reading program in the United States (Colt, 2005). Scripted lessons are often delivered via print but may also be delivered through audio-based and online instruction, as will be discussed in Chapters 2 and 13.

[2] The program had several areas of focus, including education. The author was involved in the education component of this program from 2017–2019 on behalf of MCC. As of this writing, an evaluation of the teacher upgrading program has not been completed.

Three models of scripted lessons are examined here.

1.3.1 Chile: Plan Apoyo Compartido (PAC)

This 2011 initiative, launched by the Chilean government, provided detailed classroom guides, and scripted lecture materials to teachers in schools historically performing below Chile's Sistema de Medición de Calidad de la Educación (SIMCE)—its standardized Education Quality Measurement System national examinations average. Eight hundred and forty-three schools were divided between treatment and control schools. The goal was to standardize pedagogical materials and close academic achievement gaps between the lowest-income student population and the national average.

One year later, reading, math, and science test scores for students in Plan Apoyo Compartido (PAC) schools improved between 0.09 and 0.13 standard deviations[3] relative to comparison schools. The effects were larger in 2012 than in 2011. Researchers attributed this change to program maturation and improved implementation. Overall, the program resulted in persistent and improved academic results over time. However, like many education interventions, the PAC program was most successful in schools with higher socioeconomic status, with test scores improving by 0.20 standard deviations among students from more well-off PAC schools (Bassi et al., 2020).

1.3.2 Kenya: New Globe Schools

Formerly known as Bridge International Academies, New Globe Schools is a Kenyan for-profit school chain operating in Kenya, Nigeria, Uganda, Liberia, Rwanda, a Beirut-based camp for Syrian refugee children, China, and India.[4] It provides primary school teachers with tablets that include scripted activities that they follow in order to standardize instruction across their country's primary schools (New Globe Schools, n.d.). Instructions lay out exactly what to write on the blackboard and even when to walk around the classroom. These tablets also are used to assess student learning and feed information back to the head office (via 2G cellular connections) so New Globe can analyze its instructional model and make appropriate adjustments.

New Globe schools reported that students learned in two years what Kenyan primary age students typically learned in three.

A study of 10,000 Kenyan students in New Globe schools reported that students learned in two years what Kenyan primary age students typically learned in three. In academic terms, New Globe increased student learning by 1.35 standard deviations (SDs) for Early Childhood Development students and 0.81 SDs for primary students up to grade 8—effects that, according to the study's lead researcher, are "among the largest in international education literature" (Gray-Lobe et al., 2022, p. 3). Researchers attribute these positive gains to a combination of scripts to standardize quality, the use of tablets for formative assessment and quick data analysis, professional development, and wraparound supports for teachers.

1.3.3 Democratic Republic of Congo (DRC) and Cameroon: "Chalkboard Guides"

"Chalkboard Guides" are structured, print-based lesson guides for teachers in emergency contexts

[3] The Standard Deviation (SD) measures the amount of variance across a set of values. A low SD suggests that the values are close to the mean (expected value). A high SD indicates that the values are spread out over a wider range. For purposes of interpretation, Lipsey et al. (2012) provide a more intuitive interpretation of standard deviations. A 0.10 SD means a learner would move from the 50th to 54th percentile; a 0.20 SD means they move from the 50th to 58th; a 0.30 SD means from the 50th to 62nd percentile and 0.40 SD from the 50th to 66th percentile.

[4] New Globe operates its own private schools but also increasingly sells its tools and trainings to local and national education authorities (as in China and Rwanda) so they can run government schools according to the New Globe model.

where resources are especially scarce and learning outcomes are quite low. Developed by non-profit organization Justice Rising, teachers in the conflict-stricken eastern Democratic Republic of Congo (DRC) and in Cameroon are given one-page-per-lesson guides focused on effective use of the chalkboard—hence the name. The guides are based on the tradition of Japanese chalkboard teaching practices—*bansho*—where teachers fill the chalkboard in creative ways to summarize, organize, and link a sequence of lesson events to facilitate collective thinking (Emerling, 2015). The chalkboard guides also draw from cognitive load theory[5] and behavioral science in their design (Ee-Reh Owo, personal communication, May 23, 2022). Teachers take photos of the chalkboard to disseminate to learners.

Scripted lessons are a popular form of embedded teacher professional development and a mechanism to assure quality instruction. Research on scripted lessons, though limited, is generally positive. For example, in a randomized controlled trial (RCT) across 169 rural villages in the Gambia, scripted lesson plans, together with after-school supplementary classes and frequent monitoring and teacher coaching, were credited with improved learning outcomes (World Bank, 2020). RTI International's examination of scripted lesson plans across 13 countries suggests that scripts can provide teachers with situated, just-in-time professional development while standardizing the quality of instruction and improving student learning outcomes *if* teachers adhere to the scripts and *if* the scripts are easy to follow (Gray-Lobe et al., 2022; Piper et al., 2018). Scripted lessons are not without their critics, however, in large part because of their perceived removal of teacher agency, their deprofessionalization of the teaching profession, and mechanization of teaching (Wyatt-Smith et al., 2019).

Research suggests that for scripted lessons to be effective, they must be implemented with fidelity. Modifying scripted lessons—that is, changing the sequence of activities, adding or omitting content, or eliminating or reducing activities—negatively affects the lessons (Piper et al., 2018). While fidelity of implementation is important, particularly as

Figure 1.1
Open Universities

Open universities are distance education universities that combine various forms of distance technologies with some face-to-face instruction to provide learning opportunities to nontraditional students (students over 21 or working professionals). They are open to all learners, regardless of qualifications, hence the designation "open" university. One of the most venerable is the United Kingdom's Open University, which was founded in 1969 as the University of the Air.

Inspired by the U.K. model, open universities were established in earnest across Asia in the 1980s in order to educate the continent's young population, many of whom were graduating from secondary school with skills that did not equip them for the world of work. Because of their large student populations, these open universities have been termed "mega-universities" and are often the main source of tertiary education in their countries. One example is India's Indira Gandhi National University. With over 7 million students, it is the largest open university—and university—in the world (Indira Gandhi National Open University, 2023).

Open universities are typically "single-mode"—teaching off-campus students but not on-campus ones. However, some are "dual-mode"— offering parallel off-campus and on-campus degree programs or what is increasingly being termed "hybrid" instruction. Chapters 5 and 19 will return to a discussion of dual-mode institutions.

[5] For Sweller (1988), cognitive load theory describes the way human beings process information. Cognitive load can be *intrinsic* (the effort associated with a specific topic), *extraneous* (the way information or tasks are presented to a learner), and *germane* (the work put into creating a permanent store of knowledge or schema). Sweller noted that working memory is able to hold only a small amount of information at any one time. Thus, instructional methods must pay attention to design and presentation of learning activities to avoid cognitive overload.

teachers are learning content and instructional strategies, it may become less so as teachers learn more, discern what works best for students, and begin to outgrow the constraints of the scripted lessons. In this case, teacher professional development (TPD) providers and materials designers may want to allow "adaptation with guardrails"—helping teachers gradually modify aspects of the innovation while sticking to its core elements—or use full scripting initially while eventually reducing to lighter scripting later in the guide or series of guides (Hill et al., 2022; Piper et al., 2018).

1.4 Considerations: Print and Text for Distance Education

As noted at the beginning of this chapter, computer technology is increasingly used as a distribution medium for *text-based* instruction, either through content management systems alone or as part of online classes. Such courses are often found in low-bandwidth environments and are often part of open university courses. (See Figure 1.1.) Teachers download *Word* documents and Portable Document Formats (PDFs) and either print them or read them on a screen. Indeed, many open universities use technology, such as Universal Serial Bus (USBs or "pin drives") or the Internet as distribution channels for text-based instruction or as print distribution mechanisms (Latchem & Jung, 2010).

As more distance learners access continuing education via the Internet, tablets, and phones, exclusively print-based correspondence courses are becoming less frequent as they are increasingly bundled with multimedia, video, or audio. That said, remote learning during COVID-19 pandemic school lockdowns was a stark reminder that print still offers compelling strengths as a distance education mode, particularly for students and teachers who lack access to electricity, broadcast services, and/or the Internet.

1.4.1 Benefits of Print-and Text-based Distance Education

Print offers numerous benefits as a mode of distance education, several of which are enumerated here.

Print is affordable

Print's greatest attraction may be its cost. Both its production and distribution costs are low relative to other forms of distance education. Print is easy to reproduce, portable, ideal for self-study, and a familiar medium for teachers. Paper textbooks can be stored and easily referenced; they are easy to retrieve (reach across your desk); and they don't require a power source (Hollander, 2012).

The effectiveness of the high-resolution nature of print has been largely corroborated by research on print-based distance education.

Print is effective

Print is a far better medium for reading comprehension and learning than a computer screen (Kong et al., 2018). (Figure 1.2 discusses the challenges of reading from a screen.) This may be because paper, in particular two-page spreads, are significantly "higher resolution"—entirely in the learner's field of view—than are digital displays (Tufte, 2001).

The effectiveness of the high-resolution nature of print has been largely corroborated by research on print-based distance education. When and where they were used extensively, print-based correspondence courses overall have shown documented effectiveness vis-à-vis courses taught in conventional settings (Perraton, 1993). However, as will be discussed, print isn't for everyone. Nielsen & Tatto (1993), in their study of in-service distance education in Sri Lanka, reported that exit-level in-service teachers who matriculated through a print-based program scored *lower* (with the exception of language)

than did exit-level candidates from colleges of education in teacher training colleges.

Figure 1.2
The Challenges of Reading from a Screen

What is the problem reading from a computer or phone screen? Simply put, human beings do it badly—mainly for three reasons. The first is "cognitive load" (the cognitive processing demands placed on a person). Scrolling and increasing font sizes clogs our mental bandwidth, increasing extraneous cognitive load, making reading from a screen exhausting and resulting in less capacity to remember information (Skulmowski & Xu, 2022; Sweller, 2010).

Next, given the connected nature of the World Wide Web, we often spend less time on a page before jumping somewhere else, and perhaps not returning to our original reading. Finally, according to studies using eye-tracking software, when we read online, we do so in an "F" pattern, versus reading the entire content as we are more likely to do with a book (Burns, 2019).

Cumulatively, these three online reading behaviors denigrate the process of reading itself. Rather than employing "deep reading" processes—focused, sustained attention to and immersion in the text—online readers spend more time utilizing shallow reading techniques—browsing and scanning, keyword spotting, non-linear reading (Wolf, 2018). These behaviors have serious "downstream effects" that readers have transferred to offline reading—resulting in the inability to comprehend, critically analyze and read long pieces of complex text (Carr, 2011; Wolf, 2018).

Print and text-based learning are highly familiar media that have been popularized by technology

The World Wide Web has transformed reading and books into a more collaborative and social experience. Websites such as *Goodreads* are forums for readers to share, discuss, and review books they are reading. Websites such as Google *Books* and *Project Gutenberg* allow users to read thousands of free digitized texts, and free tools like *Calibre* enable learners to create their own virtual library and bookshelves. Chrome browser extensions and apps such as *Hypothes.is*, *Perusall*, and *Kami* make it possible for learners to digitally annotate text on their screens as they read.

Most likely, print will continue to shift from a paper medium to a digital one, as with phones and tablets. These technology platforms can address some of the production and distribution issues associated with print-based documents. But no technology has yet been able to replicate the ease of use, tactile experience, the ability to write in margins, and the ease of navigation of paper.

1.4.2 Limitations of Print and Text-based Distance Education

However, there is a variety of challenges associated with print/text-based instruction that weaken its efficacy as the sole source of teacher instruction.

Many contexts are print-poor

Developing a print-based distance course is deceptively difficult. It depends on spoken languages having a written alphabet; abundant, quality educational local language content and training materials from which distance providers can choose and which they can afford; and a functioning educational publishing sector with laws around copyright and intellectual property to stimulate both production and publication efforts. Many contexts across the globe lack one or all of these attributes. Thus, many distance programs rely on open educational resources (OER), which in part address such issues, or they end up using out-of-date content. Many distance programs translate existing materials into local languages but these translations may be inaccurate and thus problematic (T. Vitolo, personal communication, June 7, 2022). Print materials may be poorly written, and text may be particularly difficult for learners with disabilities such as dyslexia or even useless for those who are blind or suffer from impaired vision.

Print-based distance learning also suffers from myriad production, copying, and transportation issues. For example, textbooks and associated tests may be poorly constructed and contain errors, which may be hard to correct because of the print-based format. The variable quality of paper, printer toner, and copying machines can make print hard and unattractive to read—seemingly minor points that nevertheless negatively affect legibility, reader interest, and the effectiveness of print as a learning tool. Damage rates from water, heat, and mold are high. Distance education providers often run out of paper and copier toner, postal services are unreliable in many parts of the globe, and it is not uncommon for teachers to report that their textbooks or exams were lost in the mail.[6]

Many teachers or teacher-candidates may neither like to read nor be particularly strong readers

Many teachers, like their students, may struggle with reading for a variety of reasons. The focus on text disadvantages struggling readers, those who may have reading disabilities, or those who may simply learn better using another modality. In more orally based cultures, print may be a suboptimal learning alternative. Print- and text-based scripted lessons also place large literacy burdens on teachers—particularly in terms of comprehending more academic and technical writing that is often long and complex, which may account for the use of other scripted technologies such as radio and multimedia.

Nor is text the best vehicle for helping teachers learn application of skills, processes, or procedures. This often results in a quantity-absorption tension. Because teachers' knowledge of a certain topic may be low, or a particular skill is complex, authors may create lengthy texts for teachers to read.[7] However, the inefficiency of text as a tool to convey complex information and the length of the text

Figure 1.3
E-readers

E-readers, slate-like devices that use electronic ink to deliver books digitally, are designed exclusively for reading and thus function like a paper book: The user can turn pages, skip ahead to the end of the book, annotate sections, and save his or her place with a "bookmark."

The benefit of e-readers as a teacher education tool is that they can store hundreds of books and documents, thus mitigating issues associated with physical storage or postal delivery and giving the teacher access to an entire library that is both portable and lightweight. E-readers such as Amazon's *Kindle* or Kobo *Clara HD* have gray backlighting, making them ideal for reading in bright sunshine, and a battery that lasts for weeks or even months. Both can access cellular networks that allow the user to download a book onto the e-reader instantly.

This chapter mentions several of the drawbacks associated with print-based and text-based distance learning. E-readers do not remedy all of these issues—for example, the prerequisite of literacy and the inefficiency of text as a tool to convey complex information—but they do address a number of them, especially the problems of storage and updating information. Many e-readers come with text-to-speech options and support note taking and handwriting. Adjustable font sizes and types make it easier for those with vision problems to use an e-reader than to read a paper book.

However, there is still scant research on the educational benefits of e-readers, particularly in terms of teacher education or adult learning. Data that do exist examine the e-reading experiences of students. One survey of 2,000 U.S. students aged 6 to 17 reported that students who normally dislike reading paper-based books enjoyed reading from digital readers and would read more books if they had e-readers (Bosman, 2010). A more recent series of studies of the reading habits of teens in the U.K., U.S., Portugal, Slovenia, and Finland found that teens still prefer reading from print books (Myrberg, 2017).

[6] Based on the author's experience with distance learning programs in Africa and interviews with UTDBE candidates in 2006 and 2008.

[7] The irony of such a statement is not lost on the author of this several hundred page guide.

needed to impart skills may, in turn, intimidate and deter teachers from actually reading it.[8]

The benefit of e-readers as a teacher education tool is that they can store hundreds of books and documents, thus mitigating issues associated with physical storage or postal delivery

In the case of text-based instruction, reading from a screen is challenging

Figure 1.2 explains the difficulty of reading and comprehending text on a standard computer screen, tablet, or phone. Comprehension and cognitive-load issues aside, reading from a screen is hard on the eyes and difficult in bright sunlight or natural light, a consideration in many parts of the world.

However, as Figure 1.3 suggests, e-readers can help with these reading issues to some degree. Backlighting can reduce eye strain, readers can increase font sizes, and embedded supports such as dictionaries and text-to-speech supports can mitigate some of the pressures of reading from a digital device.

Print/text-based instruction suffers from perception problems

Policymakers may regard print-based distance learning—or indeed paper itself—as outmoded. Many agitate for more technology-based forms of distance learning, even when such options are not feasible and even though the technology may, in fact, serve only as an expensive delivery system for print-based learning.

Print-based courses suffer from high attrition rates

Years of research suggest that print-based distance education courses have traditionally suffered from high attrition rates, largely because they invoke the model of the teacher-learner as a solo practitioner (Nielsen & Tatto, 1993; Perraton, 1993; Potashnik & Capper, 1998). Like Margaret, whose distance education experience was described in the Foreword of this guide, learners, for the most part, study at their own pace with little or no supervision or collaboration with colleagues. When collegiality or supervision occur, they typically do so through annual summer residential sessions that take place away from school, where teacher-learners need the most support when implementing novel ideas or practices. Where there have been exceptions to this solo-learner model and ongoing human supports (study circles and group tutors) and media support (radio and television) have been provided, as in print-based distance courses in Sri Lanka and Indonesia, these print-based programs experienced higher completion rates (Nielsen & Tatto, 1993).

1.5 Summary of Print-based and Text-based Distance Education

Chapter 12: Developing Content will revisit print again. Figure 1.4 summarizes the role of print-based distance learning and its strengths and limitations as a distance education mode.

[8] Based on the author's interviews with Ghanaian teachers in 2006 and 2008.

Figure 1.4
Overview of Print- and Text-based Distance Education

Roles in Teacher Professional Development	Strengths	Limitations
• They provide self-paced professional development for teachers and access to learning resources. • They often are supplemented by face-to-face institutes/ workshops or by some form of audio instruction. • They frequently are used as a supplement to some other form of media-based distance education (radio or television). • They traditionally have been used in very low-resource environments. • The World Wide Web, e-readers and digital tablets have improved production, reproduction, storage of, and access to text. • Screen readers and speech-to-text programs offer visually impaired teacher-learners access to computer-based text. • Technologies, such as QR codes, can augment print-based information.	• Reading promotes sustained cognition. • Paper works anytime, anyplace. It does not depend on Internet connectivity, technology skills, electricity, or access to hardware and software. Nor does it crash or get infected with viruses or malware. • Print is a versatile and portable form of learning—easily developed, shipped, and distributed, and teachers can carry materials to school or home for study. • Print materials take advantage of the long tradition of the written word to convey information. • Print-based reading has consistently been shown to result in greater comprehension and retention than reading from a digital screen (Carr, 2011; Kong et al., 2018). • Web-based connectivity potentially means greater access to, variety, and dissemination of text-based resources. • Print-based materials are less costly to produce and distribute than other forms of distance education.	• Print-based learning does not allow collaboration between readers—as opposed to text-based digital resources, where teachers can collaborate from distinct locations. • Success is contingent upon a high degree of literacy and enjoyment of reading. • Print materials often lack high-quality or interactive content. • Textbooks can't model behavioral and attitudinal elements of effective teaching, nor can they model interactive instruction. • Print may be better for learning concrete facts and concepts as opposed to abstractions, skills, and behaviors. • Print may be less energy-efficient than simply reading on a screen due to the energy required in printing and copying and the creation and disposal of paper.

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References

Associates for Change. (2016). *The impact assessment of the untrained teacher diploma in basic education: Endline study.*

Bassi, M., Meghir, C., & Reynoso, A. (2020, October). Education quality and teaching practices. *The Economic Journal, 130*(631), 1937–1965. doi:https://doi.org/10.1093/ej/ueaa022

Bosman, J. (2010, September 29). In study, children cite appeal of digital reading. *New York Times.* http://www.nytimes.com/2010/09/29/books/29kids.html

Burns, M. (2019, April 14). *To read or not to read: Text in an online world.* eLearning Industry. https://elearningindustry.com/text-in-an-online-world-read

Carr, N. (2011). *The shallows.* WW Norton.

Colt, S. (2005). *Do Scripted Lessons Work-or Not?* PBS. https://www.pbs.org/makingschoolswork/sbs/sfa/lessons.html

Emerling, B. (2015, April 26). *Lessons learned from a chalkboard: Slow and steady technology integration.* Larry Cuban on School Reform and Classroom Practice. https://larrycuban.wordpress.com/2015/04/26/lessons-learned-from-a-chalkboard-slow-and-steady-technology-integration-bradley-emerling/

Graham, A., & Owusu, A. (2018). An evaluation of the untrained teachers diploma in basic education (UTDBE) programme in Ghana. *Journal of Education and Practice,* 9(36), 75–82. https://www.iiste.org/Journals/index.php/JEP/article/viewFile/45781/47265

Gray-Lobe, G., Keats, A., Kremer, M., Mbiti, I., & Ozier, O. (2022). *Can Education Be Standardized?* Evidence from Kenya. New Globe Schools. https://issuu.com/newglobe/docs/can_education_be_standardized_evidence_from_kenya?fr=sZWEzMjUwOTg0NjU

Hill, C. J., Bloom, H. S., Black, A. R., & Lipsey, M. W. (2008). Empirical benchmarks for interpreting effect sizes in research. *Child Development Perspectives,* 2(3), 172–177. doi:10.1111/j.1750-8606.2008.00061.x

Hollander, J. (2012, October 10). Long live paper. *New York Times.* https://www.nytimes.com/2012/10/10/opinion/long-live-paper.html

Indira Gandhi National Open University. (2023). *Indira Gandhi National Open University.* Preamble. http://www.ignou.ac.in/ignou/aboutignou/profile/2

Kong, Y., Seo, Y., & Zhai, L. (2018). Comparison of reading performance on screen and on paper: A meta-analysis. *Computers & Education,* 123, 138–149. https://doi.org/10.1016/j.compedu.2018.05.005

Latchem, C., & Jung, I. (2010). *Distance and blended learning in Asia.* Routledge.

Lipsey, M. W., Puzio, K., Yun, C., Hebert, M. A., Steinka-Fry, K., Cole, M. W., . . . Busick, M. D. (2012). *Representation of the effects of education interventions into more readily interpretable forms.* National Center for Special Education Research, Institute of Education Sciences, United States Department of Education. https://ies.ed.gov/ncser/pubs/20133000/pdf/20133000.pdf

Millennium Challenge Corporation. (n.d.). *Guatemala threshold program: Investing in Guatemala.* Millennium Challenge Corporation: https://www.mcc.gov/where-we-work/program/guatemala-threshold-program

Myrberg, C. (2017). Why doesn't everyone love reading e-books? *Insights, 30*(3), 115–125. http://doi.org/10.1629/uksg.386

New Globe Schools. (n.d.). *The history of New Globe.* https://newglobe.education/newglobe-history/

Nielsen, H., & Tatto, M. (1993). Teacher upgrading in Sri Lanka and Indonesia. In H. Perraton (Ed.), *Distance education for teacher training* (pp. 95–135). Routledge Press.

Perraton, H. (Ed.). (1993). *Distance education for teacher training.* Routledge Press.

Piper, B., Sitabkhan, Y., Mejia, J., & Betts, K. (2018). Effectiveness of teachers' guides in the in the Global South: Scripting, learning outcomes, and classroom utilization. *RTI Press Publication No. OP-0053-1805.* https://doi.org/10.3768/rtipress.2018.op.0053.1805

Potashnik, M., & Capper, J. (1998). *Distance education: Growth and diversity.* World Bank.

Skulmowski, A., & Xu, K. (2022). Understanding cognitive load in digital and online learning: A new perspective on extraneous cognitive load. *Educational psychology review,* 34, 1–26. https://doi.org/10.1007/s10648-021-09624-7

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12,* 257–285. https://onlinelibrary.wiley.com/doi/epdf/10.1207/s15516709cog1202_4

Sweller, J. (2010). Element interactivity and intrinsic, extraneous, and germane cognitive load. *Educational Psychology Review, 22*(2), 123–138.

World Bank. (2020). *Cost-effective approaches to improve global learning: What does recent evidence tell us are "Smart Buys" for improving learning in low and middle income countries?* The World Bank. https://documents1.worldbank.org/curated/en/719211603835247448/pdf/Cost-Effective-Approaches-to-Improve-Global-Learning-What-Does-Recent-Evidence-Tell-Us-Are-Smart-Buys-for-Improving-Learning-in-Low-and-Middle-Income-Countries.pdf

Tufte, E. (2001). *The visual display of quantitative information* (2nd ed.). Graphics Press.

Wolf, M. (2018, August 25). Skim reading is the new normal. The effect on society is profound. *The Guardian.* https://bit.ly/2BMd3Bb

Wyatt-Smith, C., Lingard, B., & Heck, E. (2019). *Digital learning assessments and big data: Implications for teacher professionalism.* UNESCO Education Research and Foresight-Working Papers. https://unesdoc.unesco.org/ark:/48223/pf0000370940


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