

INTRODUCTION TO THE SPECIAL ISSUE

Technology Transience: Opportunities, Challenges, and Implications

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Technologies have lifespans. Loosely speaking, a technology's lifespan can be defined as the time between the technology's initial "birth" (its creation), to adoption and dissemination (where the technology moves it to a state where it penetrates its target audience), then, over time, moving toward obsolescence and, at some point, elimination from common use. This arc of a technology's full lifespan, sometimes called its "time horizon," is of interest to businesses (who require that a technology provide a profit during its usage), economists (who look at the financial impact of a technology on sector-based and national budgets), governments (who look at a technology's societal impact, as well as its facility in supporting the workings of governmental institutions) and, to no less an extent, educators (who attempt to leverage technology in the design, development, delivery, and evaluation of learning). The concept of technology lifespans is therefore of significant interest to an extremely wide range of audiences, and there are ultimately few areas that are left unaffected

by the never-ending—and increasingly abbreviated—technology life cycle.

We are today more than ever conscious of technology lifespans. Our hardware devices become obsolete in a very short time. Software, which we go to great pains to learn, is frequently replaced by "improved" and "extended" versions that necessitate retraining as a result of completely revised user interfaces and, not infrequently, paradigmatic changes in how the software operates. Users often find themselves in an "update cycle" with hardware releases offering ever more features, but also bringing along with them the requisite learning that these new devices require. And it is not just the individual user who wrestles with the issue. As organization-wide technology changes are implemented in an attempt to maintain competitiveness and increase the security of both user and organizational data, these organizations find the issues surrounding technology transience exponentially multiplied across infrastructure, training, support, and economic concerns.

It is not simply the fact that technologies possess lifespans, but the recognition that technology lifespans are increasingly shortened that impacts our day-to-day lives. Today's context is replete with new technologies that move toward obsolescence in remarkably little time. "Ancient" technologies, such as the printed book or the candle, for example, have measured their lifespans in centuries and, even as late as the early 21st century, have not yet fully progressed into obsolescence, but most modern technologies do not possess this extended "useful lifespan."

Technology lifespans are correlated with the context in which they exist. Some 20% of the world's population, for example, remains without access to electricity, making candles, an extremely ancient technology, an ongoing and important part of their lives. Printed books, also an "old" technology, may be viewed from two vantage points: first, the proportion of the global population for whom books are inaccessible, not due to deficiencies in printing, but because of illiteracy; and second, the proportion of the population that is literate, but cannot gain access to books due to a variety of economic and political factors (placing printed books, in this specific context, within the adoption and dissemination stage of the technology lifespan).

By contrast, broadcast radio, just over a century old, is already a mature technology, and may soon be largely replaced by other voice dissemination and communication technologies within advanced economies. More recent technologies, of which the so-called "netbook" might perhaps be an exemplar, may measure their useful lifespan within the time frame of a mere decade or two. And the most recent technologies today—and this is particularly true of smartphones and their associated apps—may exist for only a few months before being replaced. Indeed, in some cases, technologies possess so brief a lifespan horizon as to be labeled with the term "fad," even in cases when significant amounts of income have been invested in their development, and the poten-

tial utility of the technology had been hailed as great.

The challenges arising from these scenarios are numerous. An overarching question is whether ever-shortening technology lifespans are a universally applicable issue, or whether they are a phenomenon that must be carefully analyzed *in situ*, impacted by variables such as geographical location, community, individual, collective background and attributes, dispositions, and age. If this is indeed the case, what does this imply for how we experience, observe, and respond to technological transience?

These provocative questions born from the recognition of shortening technology lifespans undoubtedly have impact across all aspects of our existence. They also yield questions that possess particularly dramatic implications for the world of distance education. Because distance education is dependent on technology as the mechanism mediating its existence, the modality is uniquely exposed to both the opportunities and perils of technology innovation which, in today's context, can be described as possessing large amplitude (i.e., new technologies are often highly innovative, and potentially offer powerful new educational capabilities) and high frequency (i.e., specific technologies come and go in a very short time frame). Compounding this reality is the fact that distance education courses not only utilize technology for instructional delivery, but also frequently have technology as their subject matter. A prime example would be distance courses focused on assistive technologies, where learning both the operation of the technologies, as well as their pedagogical implementation, form the basis for the course curriculum. Rapid changes to technology in such a setting can force extensive changes in pedagogy, instructional delivery, and desired learner outcomes.

The large and frequent number of technology innovations, as well as the concomitant movement toward rapid technology obsolescence, leaves almost no aspect of distance learning systems untouched, including issues

that extend beyond the instructional use of technology. Distance education administrative decisions, policymaking, and program leadership are all impacted by technological change, and include factors as varied as infrastructure costs, personnel and instructor training, and ongoing maintenance of course content. Nevertheless, the demand to integrate the newest technologies can be intense, often driven by educators who are quick to see new instructional capabilities made possible by the latest technologies, as well as by students who are often already using these technologies in their out-of-classroom lives. This can position educational administrators between two opposing forces: educators who wish to adopt newer technologies to extend instructional capabilities, and institutional leaders who have the responsibility of keeping costs within budget. Today's dramatic oscillations and ever-shortened technology life cycles, as well as the accompanying phenomenon of competition between technologies that erode dominance and long-term usage of any single technology, can be seen to be simultaneously stressing today's distance education courses and programs at the curricular, instructional, financial, and structural levels.

The goal of this special issue of the *Quarterly Review of Distance Education* is to highlight how these rapid and substantial changes in today's technologies are affecting, and will

continue to affect, distance education and the broader educational field. To do so, we have brought together a series of researchers and practitioners uniquely positioned to examine this issue from a variety of vantage points. These include conceptual issues (Amirault; Wistera), data security (Dennen), health care education (Bosch, Alkhomsi, & Hartenberger Toby), assistive technologies (Peterson-Karlan), collaborative technologies (Chang & Hannafin), health care education (Hill), educational leadership (Beaudoin), teacher preparation (Muilenburg & Berge), instructional design (VanBerschoot & Summers) and personal learning environments (Torres Kompen, Monguet, & Brigos).

To summarize the discussion, Karen Swan has developed a reflective response to the issue's content, and the editors are deeply appreciative of her willingness to serve in this key role. The editors would also like to thank Lindsey Sieck, whose assistance with editing was invaluable in the development of this special issue.

The very nature of transience makes prediction difficult and fraught with risk, but thereby also underscores the importance of the issue as it unpredictably impacts nearly every aspect of education. We hope you find the contributions of our esteemed authors illuminating and beneficial as you read the issue.