foyer
The Journal of Humanities, Social Sciences, and Education

# Looking Back on Predictions of Global English: Applying Technology Theory to Develop Critical Multilingual Language Awareness

*Christopher Leslie*
*Faculty of Liberal Arts, Prince of Songkla University*

Received: July 7, 2024
Revised: January 17, 2025
Accepted: February 26, 2025

**Abstract**

The social construction of language norms has become an increasingly important theme at a time when generative AI and other language-based technology proliferate. One theme of the research and pedagogical approach known as critical multilingual language awareness (CMLA) seeks to understand the impact of ideology on language learners. This paper shows how an episode from the history of the Internet can promote CMLA. At the end of the 1990s, some journalists, essayists, and scholars writing about the Internet were preoccupied with the idea that technology would cause English to replace other languages worldwide. In this nonfiction literature, these writers' dramatic predictions about language use were bolstered by the profits of the dot-com boom as well as the fallacy known as technological determinism. Even when computing technology was available to support multiple languages, these authors neglected to consider the cultural capital that underwrote their analyses that supported English as a global language. Insights from the social construction of technology provide a framework for analyzing primary sources that suggest that technology would give English an advantage globally because other languages were incompatible with the technological world. That this prediction was false is evident today, when people can communicate online easily in many languages. More importantly, though, this episode supports CMLA in

teaching and writing in practical ways. A more nuanced view of the interaction between technology and society helps writers and educators consider the impact of new technologies.

**Keywords**

critical multilingual language awareness, global Englishes, nonfiction literature, technological determinism

Foyer
The Journal of Humanities, Social Sciences, and Education

# ย้อนรอยทิศทางภาษาอังกฤษโลก: การใช้ทฤษฎีเทคโนโลยีพัฒนาความตระหนักรู้ทางพหุภาษาอย่างมีวิจารณญาณ

*คริสโตเฟอร์ เลสลี่*
*คณะศิลปศาสตร์ มหาวิทยาลัยสงขลานครินทร์*

**บทคัดย่อ**

ในยุคที่การใช้งานปัญญาประดิษฐ์แบบรู้สร้าง (generative AI) และเทคโนโลยีเกี่ยวกับภาษาแพร่หลาย การวางบรรทัดฐานภาษาในระดับสังคมได้กลายเป็นประเด็นที่มีความสำคัญอย่างยิ่งยวด การวิจัยและวิธีการสอนที่เรียกว่า ความตระหนักรู้ทางพหุภาษาอย่างมีวิจารณญาณ (critical multilingual language awareness: CMLA) นับเป็นประเด็นหนึ่งที่มุ่งสร้างความเข้าใจเรื่องการนึกคิดที่มีผลต่อผู้เรียน งานวิจัยเรื่องนี้ชี้ให้เห็นว่าการใช้งานอินเทอร์เน็ตในอดีตสามารถส่งเสริม CMLA ได้ในระยะเวลาหนึ่ง ในปลายทศวรรษที่ 1990 ผู้สื่อข่าว นักเขียน และนักวิชาการบางส่วนที่ผลิตงานเขียนประเภทสารคดีเกี่ยวกับอินเทอร์เน็ตต่างมีความคิดที่ว่า เทคโนโลยีจะส่งผลให้ภาษาอังกฤษเข้ามาแทนที่ภาษาอื่น ๆ ทั่วโลก งานเขียนเหล่านี้สะท้อนให้เห็นว่า ผลพวงในยุคที่อินเทอร์เน็ตรุ่งเรือง (dot-com boom) รวมไปถึงความเชื่อผิด ๆ เกี่ยวกับทฤษฎีเทคโนโลยีเป็นตัวกำหนดความก้าวหน้า (technological determinism) คือเหตุผลที่ทำให้มีการคาดการณ์ทิศทางของภาษาเกินความเป็นจริง นอกจากนี้ แม้เทคโนโลยีคอมพิวเตอร์ในช่วงนั้นสามารถรองรับภาษาได้หลากหลาย แต่ผู้ผลิตงานเขียนเหล่านี้กลับมองข้ามเรื่องต้นทุนทางวัฒนธรรมที่นำไปสู่การวิเคราะห์ภาษาอังกฤษให้เป็นภาษาโลก ดังนั้น ความเข้าใจการประกอบสร้าง

เทคโนโลยีในระดับสังคมจึงเป็นกรอบการวิเคราะห์แหล่งข้อมูลชั้นต้นที่แสดงให้เห็นว่า เทคโนโลยีเอื้อข้อได้เปรียบให้ภาษาอังกฤษไปทั่วโลก เพราะภาษาอื่นไม่สามารถสอดรับกับโลกเทคโนโลยีได้ การคาดการณ์ก่อนหน้านี้จึงไม่ตรงตามสถานการณ์ในปัจจุบันที่ผู้คนหันมาสื่อสารกันด้วยภาษาที่หลากหลายผ่านช่องทางออนไลน์ได้อย่างง่ายดาย อย่างไรก็ตาม หน้าประวัติศาสตร์หน้านี้กลับมีความสำคัญในการส่งเสริม CMLA ในการสอนและการเขียนได้เป็นอย่างดี จึงกล่าวได้ว่า การมองปฏิสัมพันธ์ระหว่างเทคโนโลยีกับสังคมให้ลึกซึ้งยิ่งขึ้นย่อมช่วยให้ผู้ผลิตงานเขียนและผู้สอนเห็นความสำคัญของผลกระทบจากเทคโนโลยีใหม่ ๆ ได้

**คำสำคัญ**

ความตระหนักรู้ทางพหุภาษาอย่างมีวิจารณญาณ, ภาษาอังกฤษโลก, งานเขียนประเภทสารคดี, ทฤษฎีเทคโนโลยีเป็นตัวกำหนด

## Introduction

In the 1990s, authors were enthusiastic about the transformative potential of the Web and other Internet-based technologies. Authors of nonfiction literature (i.e., journalism, essays, and scholarship) emphasized the importance of communication in English and suggested that the potential of the Internet and the Web to remake the social world would promote equality. Some went as far to say that global communication would be conducted only in English, and people who did not speak English would be left behind. These writers of nonfiction literature about the Internet predicted that non-alphabetic languages – or even alphabetic languages that did not use Roman alphabets – would fall into disuse because they were inefficient interfaces for computing.

Flash forward to the present time, and one can see these predictions were grossly overstated. What would these authors say about today's netizens chatting with their friends on mobile devices, efficiently using tiny keyboards to communicate in Arabic, Chinese, Khmer, Thai, and other languages with complex scripts? If only one could bring these authors thirty years into the future. Users have their eyes glued to their phones, making plans, seeking advice, arguing, reading the news, searching for an answer instead of paying attention in class, walking quickly, crossing the street safely. The human desire to connect with others is ubiquitous, unencumbered by languages not based on the Roman alphabet. Those authors at the end of the twentieth century who predicted that English was needed in order to take advantage of computing technology were earnest, even though their conclusions seem ludicrous today.

This paper demonstrates how the study of the fallacies behind the global English theory can be used as part of a critical multilingual language awareness (CMLA) pedagogy. As shown below, the assertions about the inevitability of global English were made contrary to prevailing conditions. For instance, the English-only Web was developed at a time when technical solutions could have supported many languages. In addition, it was a time when educators had begun to assert that all of a multilingual speaker's language

capabilities were important. Moreover, scholars of science and technology studies (STS) had already established that innovations do not inevitably and uniformly transform society. In this context, the assertion that technology would lead inevitably to global English seems out of place, even though nonfiction authors commonly asserted this during the early days of the Web.

The writers' utopian rhapsodies about the power of technology to transform everyday life, commercial activity, and social relations supported the uncritical acceptance of inappropriate norms regarding language use. This story is relevant today because it can inculcate CMLA, which seeks to show that linguistic norms are socially constructed. Proponents of CMLA often utilize metacognitive, reflective projects about the use of language around them. Tolerance and support for plurilingualism have been important additions to language learning pedagogies. As noted by García (2017), a further stage in the development of this pedagogy is developing "*a critical understanding of how language use in society has been naturalized*" (p. 268; emphasis in original). The story of the mistaken assumptions of these nonfiction writers about technology is effective for CMLA.

**Delaying multilingual technology during the dot-com boom**

The insistence that Internet-based technology would cause a revolution in the world's language use was most prominent in the 1990s. The dream of Internet technology as a worldwide communication resource was shared by researchers in the 1960s who established the first general-purpose computer networks.[1] However,

[1] The enthusiasm about the new world occasioned by computing has been documented elsewhere. Leslie (2016), for instance, shows the expectation of a borderless world among Internet researchers in the 1980s, something they called "Worldnet." This optimism came partly from their infatuation with science fiction that promoted suppression of indigenous cultures and the spread of white (i.e., Anglo-American, Christian, male) civilization (Leslie 2023, Ch. 9).

it was not fulfilled for decades. When it came to fruition, an artificial restriction on English use was accompanied by the belief that English would increase in prominence among the world's languages.

Tim Berners-Lee had a global vision when he named his hypertext application WorldWideWeb in 1990, even though connectivity was mostly limited to computing professionals and academic researchers in the U.S. Enthusiasm for information technology that would span the globe was inflamed by the release of the first commercial Web browser, Netscape, in 1995. The period from 1995–2000 become known as the dot-com boom, when startup companies were overvalued due to a belief a new world economy was immanent, because information technology would break barriers and reconfigure social structures. Stock prices rose in a well-known stock market bubble until March 2000, when investments lost much of their gains as the bubble deflated.

Surprisingly, given the "worldwide" appellation, Berners-Lee mandated that only one character set for Web pages as well as the URL addresses used as links, a decision that made English the *de facto* language of the Web. This standard, known as ISO 8859-1, was both restrictive and familiar. ISO 8859-1 stored basic characters in just eight bits (one byte), the smallest unit of computer memory. This meant that there were only 256 available characters.[2] Communication professionals were already used to this restriction; the standard was similar to the ACSII character set that had been used for teletype machines since midcentury. It has the upper- and lower-case Roman alphabet, some basic diacritics (letters with marks for acute, grave, circumflex, umlaut accents), Arabic numbers, punctuation marks found on an English typewriter keyboard, along with some additional characters. There were a few diphthongs and specialized characters (such as *n* with a tilde for the Spanish *eñe*). Some Internet users

[2] In practice, the available number is fewer due to various non-printable computer codes, like the one that indicates a new line. Using two bytes could have permitted 65,536 options but would have doubled the size of text files at a time when computer memory was at a premium.

developed workarounds to suit their needs: German computer users lacked *eszett* (ß, or sharp *S*), so they had the habit of typing "SS."

Computers at the time, however, could already use more characters. The Web's restriction to the first variety of ISO 8859 reveals the cultural capital of English speakers. ISO 8859 by then had varieties for Cyrillic, regions of Europe, Hebrew, Turkish, and others.[3] Aside from the multilingual varieties of ISO 8859, a new standard was under development. Today, we are familiar with Unicode for its support of thousands of emoji, but its first use was to replace varieties of ISO 8859 with a single standard. Dvorak (1992) notes the unsteady origin of Unicode, pointing out that the effort began in the early 1980s at Xerox PARC, the research center that developed Ethernet and did pioneering work in the graphical user interface that led to desktop publishing. The team, however, encountered resistance when they sought buy-in from computer manufacturers. The International Standards Organization picked up the effort and announced its support of Unicode in 1991.

The hegemonic power of English can be seen in the long delay between these initial multilingual innovations and their ultimate implementation. Internet researchers use a "request for comments" (RFC) mechanism for proposals to change communication protocols. RFC 2070, "Internationalization of the Hypertext Markup Language," then gives a January 1997 date for the first proposal to use Unicode on the Web. Finally, Web pages could use almost 40,000 characters from 25 different writing systems (Unicode having grown considerably from its original list of about 7000). In addition, RFC 2047, issued the year before, had already allowed for multiple character sets in the body of e-mail messages. From its earliest development, Web technology proscribed scripts outside of the basic Roman alphabet, a capability already in use in other computing

[3] Each computer, though, could utilize only English with another character set at a time: the first portion of each character set started with entities used by English speakers, placing specialized characters in the higher register.

contexts. The delay in implementing technologies that would allow the Web to expand beyond basic Roman alphabets was sizeable and is worth further consideration.

Prior to the time Berners-Lee mandated English scripts for the WorldWideWeb, even the unity of the English language had been questioned. The assumption that the hegemonic power of English would overstep other languages was part of the reason for the delay. This assumption was uncritically promoted, even by those with backgrounds in communication and linguistics. This is unexpected because, at the time, other professionals promoted linguistic plurality as a better model of understanding language use. Thomas McArthur (1978), for instance, suggests that there is a plurality of English dialects at the core, including but not limited to British and U.S. English. These negotiate to form an in-flux standard at the core that is also a reference point at the periphery. Braj Kachru (1991) similarly posits a core and periphery, placing native speakers from Australia, Canada, New Zealand, the UK and the U.S. in the center as the "inner circle"; twelve countries including India, Kenya and the Philippines in an "outer circle"; and eleven countries including China, Egypt, and the USSR in an "expanding" zone (p. 179). McArthur and Kachru call for an appreciation of the many varieties of English, and they note that native speakers should no longer have special status. Although the Internet was in use, neither make reference to online communication; similarly, their ideas are hard to find in the primary sources about the theories of technological global English.

The presumption that technology was forcing a transformation of the world's languages flies in the face of these linguists and the general attention paid in universities to multiculturalism in the 1990s. The journal *World Englishes* started publication in 1982, promoting plurality despite the hegemony of standard English. As well, Paul V. Kroskrity (2010) notes, linguists in the 1980s had begun to assert that judgements about language were used to "promote, protect, and legitimate" political and economic interests. This makes the theory that technology would bring about global English even stranger. To be sure, some nuanced reports at the time maintain McArthur and Kachru's respect for heterogeneous

language use (e.g., Todd 1999), yet as seen below, those who promoted global English in nonfiction about the Internet were captivated by the potential for unequivocal and uniform transformation.

**Research questions**

The dot-com era is marked by contradictions: the multilingual capabilities of computers, the belief that technology would force linguistic changes, the choice of a character set that favored English for the Web, and nonfiction writing that predicted global English. The objective of this research project is not only to untangle these contradictions but also to demonstrate the importance of this episode for those who work with technology and language education today. Accordingly, the project seeks to answer three interrelated research questions:

1. Nonfiction literature about the future of English is often polarized: either the Internet will compel everyone to use English, or users will resist the totalitarian force of global English. This does not fit with thinking in STS. What is left when one deconstructs this binary?

2. To what extent can research into nonfiction literature inform language professionals confronting new technology today, such as generative artificial intelligence, in pedagogies, research, and writing?

3. Given that the assumptions about technology and language use have so thoroughly infused language learning pedagogies, how might research into nonfiction writing support CMLA for those preparing to work (or already working in) multilingual environments?

## Relevant literature

### Critical multilingual language awareness

The need to understand the ideologies that undergird assumptions about language use has been powerfully stated by proponents of CMLA. For those interested in ameliorating global inequality in language use, studying the way nonfiction literature about technology perpetuates the cultural capital of English-speaking countries is instructive. Similar to the aims of STS, CMLA hopes to create a sense of estrangement regarding accepted norms.

As suggested by García (2017), CMLA pedagogy often takes the form of accepting multilingual students, and one can see a shift in focus from inculcating knowledge about a supposedly pure language to preparing polyphonic student speakers for a multilingual world (p. 270). Hélot et al., describing their multilingual pedagogy, offer an insight that is important for the present analysis: calls for English-language education at the start of the 2000s were tied to the presumption that advanced language skill was needed to participate in the global world, where "things, people, and money" flow easily across borders (qtd. in Hélot et al., 2018, p. 201). This idea, which was promoted by technology enthusiasts during the dot-com boom, has become a limitation in language-learning pedagogies. Hélot et al. offer an alternative to the hegemonic and colonial ideologies that infuse language education.

Studying nonfiction literature about technology can reveal the bias that CMLA seeks to thwart. As noted by Peter De Costa and Koen Van Gorp (2023), language learners and their teachers can benefit from an awareness of how power influences their expectations and aspirations. Along these lines, the present paper seeks to show how linguistic norms are socially created. The objective of this research is to show how research into primary sources about the Internet can supply important insights into, as De Costa and Van Gorp note, how "language, power, and ideology intersect with each other" (p. 555). In the spirit of asking educators and students to reflect on their own situatedness in language learning, the present study

illuminates assumptions about language and power that are conveyed by nonfiction literature about technology.

As will be seen below, writers of nonfiction about the Internet at the end of the last century presume that English will continue to spread – wiping out other languages as it does – but perhaps more importantly, that English is necessary for users to exploit modern technology. This is an ample illustration of the idea that language norms are socially constructed and exemplifies their intersection with ideology.

**Nonfiction literature about technology**

Evidence about the ideological support of the cultural capital of English speakers might seem elusive, but in fact nonfiction writing has long been studied for traces of ideologies. One tested way to study the kind of ideology described by CMLA is nonfiction literature in English.

Literature in English might be presumed to be fiction or poetry with lasting artistic merit. However, the category includes genres of prose as well. Nonfiction genres are often included in literary study, such as: journalism, essays, criticism, correspondence, memoir, autobiography, travel narrative.[4] This paper studies writing about technology as one would study other nonfiction literature in English, but this methodology is not unique to this investigation. Previous work by STS scholars show that nonfiction writing has been

[4] The tenth edition of the classic *Norton Anthology of American Literature* (Levine & Gustafson 2022), for instance, contains poetry and fiction, as might be expected. It also includes famous nonfiction literature. For instance, there are stories of enslavement, like Olaudah Equiano's *The Interesting Narrative* and Harriet Jacobs's *Incidents in the Life of a Slave Girl.* The anthology includes sermons and essays like Ralph Waldo Emerson's "The American Scholar" (as well as correspondence by Emerson and others). Scientific texts are represented, even in the anthology of the early years of the U.S., such as Thomas Jefferson's work of natural philosophy, *Notes on the State of Virginia.*

an important tool for understanding the interactions among science, technology, and society for decades.

For instance, Latour and Woolgar (1986) are pioneers of discussing technical endeavors as nonfiction literature. One chapter – appropriately entitled "Literary Inscription" – describes how the work in Jonas Salk's research laboratory was motivated by literature: writing, annotating, and exchanging texts. Lab workers, Woolgar and Latour claim, interact intensely with notebooks in a way that rivals only "a few particularly scrupulous novelists" (p. 48). Because their scientific activity aims to produce written documents, Latour and Woolgar write, even people who are unfamiliar with some of the scientific ideas can make sense of the laboratory activity because it utilizes well-known literary activities like "writing, persuasion, and discussion" (p. 52). Not only the end product, but also meetings, consultations, and small talk are centered on documents. Nonfiction literature is the nexus of scientific activity and, as Latour and Woolgar point out, can provide insight into technical culture.

Latour and Woolgar took an anthropological approach by visiting the Salk laboratory for more than a year. Shapin and Schaffer (2011), though, study nonfiction literature emanating from Robert Boyle's laboratory in the wake of the English Civil War to evaluate long-lasting misconceptions about scientific culture. Although it is impossible to visit Boyle's laboratory and witness the inception of the scientific method, Shapin and Schaffer examine nonfiction literature to construct an "insider's account," much the same way as Latour and Woolgar offered a vista onto the daily work of scientists. Their examination of the writing by Boyle and Thomas Hobbes regarding the existence of a vacuum, thus, shows that subsequent nonfiction stating that Hobbes was wrong and Boyle was right is a caricature, not the most interesting analysis. Instead, Shapin and Schaffer show a fundamental shift related to the reliance on personal observation rather than *a priori* fundamental principles that was important part of the debate.

After work like Latour, Woolgar, Shapin, and Schaffer, many scholars have used nonfiction literature to show that technology is not separate from the social world. These insights from STS suggest that technology will not have an independent impact on society in the context of language use as well.

**Technological determinism**

In the present study, one can see that some authors promote an inevitable and uniform connection between technological innovation and social change. STS scholars have already offered one way to classify this type of nonfiction literature about technology: determining the authors' adherence to *technological determinism.* Popular literature often attributes a direct and inevitable transformation of social practice by technology, an ideological discourse that STS scholars call a fallacy. Using the frame of technological determinism results in the belief that technology imparts social changes inevitably, uniformly, and unilaterally. Writers who proposed that successful diffusion of Internet technologies would inexorably promote the use of English and disadvantage users of other languages were following an interpretation based on technological determinism.

When looking at the exemplars of nonfiction writing about the Internet, it is clear that the label of determinism might need some nuance. The work of Bruce Bimber (1994) is helpful for his suggestion that technological determinism is too broad of a term. He breaks it into three types of deterministic analysis, which he calls *nomological*, *normative*, and *unintended consequences*. Nomological determinism, Bimber states, is when technology is assumed to operate autonomously, developed apart from culture and then having a uniform (and unidirectional) impact on the social world. Those who use this framework, according to Bimber, suggest that advances in technology force "social adaptations and changes" (p. 84). The normative type of determinism, Bimber says, is when technology has the effect of making the use of a technological device – or the results it produces – seem not just normal but also the only and best way to

achieve a social good. For instance, industrial societies place a high premium on "efficiency and productivity," and these ideals guide the development and use of technology (p. 82). The last type, according to Bimber, is that the development of technology can have an impact on society that was not anticipated by its promoters. As an illustration, he says the early proponents of the automobile thought it would be more hygienic than horse-driven vehicles, so the environmental consequences of petroleum-based transportation emerged "unsought and uncontrolled" (p. 85). All three types attempt to describe the relationship between technology and society and can be used to classify the extant nonfiction literature connecting language use and the Internet during the dot-com boom.

CMLA's interest in norms is a natural fit with the normative approach, which is also most favored among STS scholars. Journalistic accounts of technology, however, often rely on nomological determinism, including reports about the Internet. Some famous scholarship is in the nomological vein: Bimber cites Jacques Ellul's *the Technological Society* (1970), to which might be added works by Marshall McLuhan like *The Gutenberg Galaxy* (1962). However, STS scholars convincingly eschew this approach, demonstrating how various social contexts lead to different innovations and uses. Building on the foundation provided by Latour, Woolgar, Shapin, and Schaffer described above, Raymond Williams's work (2008) on the history of broadcast technology shows how it was utilized differently in the United States and in Germany. Thomas P. Hughes's work (1983) on the deployment of electrical systems shows how political circumstances shaped its diffusion in New York City, London, and Berlin. Technological solutions interact with local conditions, and many times innovations result as technology is transferred into new settings. These scholars make it clear that technology cannot force immediate and uniform changes as it spreads.

This theoretical basis was established well in advance of authors of nonfiction literature using technological determinism to describe the likelihood of global English during the dot-com boom. To some extent, the development of a multilingual Web demonstrates a well-known interpretive frame that STS scholars call *social constructivism*. STS scholars do not wish to say that society determines technology (i.e., social determinism) as a corrective to the fallacy that technology determines society (technological determinism). Instead, they show that an initial plurality of technical solutions or scientific explanations are eventually stabilized into one answer, and that stabilization inevitably fits in with existing social norms, technical infrastructures, and scientific beliefs. This process of plurality and stabilization are readily seen in the story of multilingual Web technology. The many possible solutions to online communication represent the plurality phase. The concept of stabilization, though, offers a way of improving the understanding of Berners-Lee's decision to develop the technology in a way that favored English-language users. This choice fit in with the accepted social norms about the anticipated users of technology. The delay in accepting multilingual technology, though, is not explained by this theory.

The resistance to multilingual technology can be explained by the thinking of another foundational theorist, Thomas Kuhn (1970). Kuhn noted that everyday science takes place within a frame of acceptable investigations and interpretations he called *normal science.* Innovators in science and technology assume that their work can be transformative and that old ideas are easily retired. This is not often the case, however, because industries and universities find new ideas disruptive, and it is expensive for them to reimagine routine procedures. As a result, aberrant data are ignored or reinterpreted in order to match the existing paradigm, keeping it alive long after it should have been discredited. Consequently, actual revolutions are quite rare. One key pedagogical takeaway from Kuhn is his statement that only way to see the resilience of paradigms is to experience how they initially accommodate contradictory information and then finally see their collapse. This experience is not easy to come by. However,

a vicarious experience can be had through studying contradictions in nonfiction literature about technology.

As illustrated by STS scholars, paradigms have a profound impact on who is deemed best suited to conduct science and which solutions are the most suitable. Accordingly, the most useful question to analyze nonfiction literature is not who was on the right side of a debate. Adding to the example of Boyle and Hobbes, Ian Hacking (1999) has pointed out, in the realm of geology, that the mineral dolomite is named after Déodat Dolomieu, who was actually mistaken about the rock's origins. Giovanni Arduino made a better deduction, but he was not as well connected as Dolomieu. It might seem that nothing could be less socially constructed than a rock, and yet Hacking has shown that even in this physical science, facts are filtered through social environments. To say that Arduino was more correct than Dolomieu misses the point: the cultural capital of an investigator influences the reception of scientific knowledge.

If knowledge about rocks can be shown to be socially constructed, surely the same insights can be used to analyze the influence of thinking about communication networks. Along those lines, the important takeaway from nonfiction literature about the Internet is not who was on the right side of the debate about global English: clearly, the prognosticators were mistaken. Instead, an investigation should reveal how the prevailing paradigm, in this case English speakers' cultural capital, was part of the normal science that hindered the paradigm shift. The resilience of the old paradigm, which contradicted not only accepted thinking in STS but also the work of linguists at the start of the dot-com boom, demonstrates the need for additional analysis at the intersection of technology and society. The objective of the current project is to fill that gap.

## Methodology

STS insights about determinism suggest a methodology to seek evidence of cultural capital in nonfiction literature about technology. Primary sources that assert a change in language use because of the Internet were analyzed for traces of the privilege afforded to anglophone users and the benefits of the cultural capital held by English-speaking countries.

In order to study theories about global English and the Internet, published nonfiction articles asserting a connection between the Internet anticipating the transformation English into an (or *the)* international language were found through Google search, Google Scholar, Jstor, and Project Muse. Relevant search terms like "English and the Internet" and "Global English and technology" were used. The date range tool provided by Google and Jstor was used to limit results from 1983 (the start of the internetworking protocol TCP/IP) to 2005 (the date of the internationalization of domain names); Project Muse does not have a date range option, so sources were arranged in reverse chronological order and examined from 1983 to 2005. Books, articles in magazines and journals, and Web pages were returned by the search. The initial list of primary sources was supplemented by backtracking citations to their original sources.

A dozen primary sources [5] were selected because they revealed the beliefs of practitioners at the time when the increased use of Internet-based technologies seemed to inevitably promote English. None appeared before the dot-com boom. The goal was not to find every mention of Internet use, but to select primary sources that represented the thinking that Internet-based technology added oil to the global spread of English. These exemplars were classified by how the authors describe the connection between technology and society,

[5] Lockard (1996); Specter (1996); Yates (1996); Crystal (1997), second edition in 2003; Godzich (1999); Pakir (1999); Tsuda (1999); Waldraff (2000); Crystal (2006), first edition in 2001; Nunberg (2001); Hjarvard (2003); Raley (2003).

either nomological or normative. From there, analysis of the assumptions and outcomes was made.

**Nonfiction literature about global English**

The assumption that global English was inescapable, and that it would inevitably create second-class citizens, was a popular theme of nonfiction writers at the end of the twentieth century. These authors assert a nomological determinism. For instance, Michael Specter (1996) writes that, in addition to a computer and a telephone line, potential netizens need "a robust command of the English language" He continues:

> whether you are a French intellectual pursuing the cutting edge of international film theory, a Japanese paleobotanist curious about a newly discovered set of primordial fossils, or an American teen-ager concerned about Magic Johnson's jump shot, the Internet and World Wide Web really only work as great unifiers if you speak English.

Others blandly write that the Internet was created by English speakers and thus it nomologically promotes English. Yates (1996) blandly states (using the passive voice, making it seem like the Internet is an agentless force) that the creation of the Internet required text stored in computer memory and passed along computer networks in a way that favored English: it was "the standard that was agreed upon" (p. 110). Later, he writes that the dominance of English-speaking users of the Internet is not imperialism, but just the technical necessity of preparing text for electronic transmittal (p. 115). Pakir (1999) writes enthusiastically about English making borders "porous," going as far as saying that the Internet makes the world "borderless" (p. 108); he notes later that speakers of other languages "have to" communicate in English when they are in cyberspace (p. 111). Nunberg (2001), writing a few months before the dot-com bust, notes that the Internet was "an American development" and thus spread fastest among the English-speaking world. He goes on to say that a new standard of English will emerge, disfavoring people who

are not native speakers but also those native speakers who are too formal. In the future, privilege will be afforded only to those in command of colloquialisms like "you've gotta be kidding." Hjarvard (2003) states that the Internet's TCP/IP protocol, like most computer code, uses English, and thus English has become the standard "for oral and written communication across national frontiers" (p. 76). Later, he asserts that the fact that more languages are appearing on the Web will not displace the importance of English, which will always be the "lingua franca" of users of Web when they cross linguistic boundaries (p. 87). For these authors, Internet-enabled communication seems to unilaterally – deterministically – require the use of English, reflecting a stabilization of the technology, despite the plurality of solutions that were available.

Like Specter, Yates, Nunberg, and Hjarvard, many authors were under the influence of nomologic technological determinism, caught in a binary debate that either the Internet would enforce or would not enforce the use of English. These are two sides of the same coin, and critics of this type seemingly disparage those who are not native speakers of English, suggesting that their limited capabilities will prevent them from gaining the most from the interconnected world. An exemplary work of nomological literature is offered by Joe Lockard (1996), a cultural critic with some interest in translation, who rails against what he calls "cyber-English." Calling cyber-English "the latest extension of a centuries-long drive toward extinction of small tribal languages," he suggests that the Internet has helped turn English into a commodity that "can be sped across international borders as customs-free bits." The Internet makes English indispensable, and the supposedly free inquiry and debate promoted online is marred by those who make *ad hominem* attacks against people with "limited English skills." Because English is a prerequisite for using the Internet, Lockard continues, the "potential for social empowerment" is undermined: "anglophone technology controls the contents of subaltern mouths," he writes. Even as he purports to support people who are not native speakers of English, his use of words like "tribal" and "subaltern" to describe speakers of other languages implies some bias. What makes this bias more troublesome

is the fact that this requirement for English was a design decision, not an intrinsic characteristic of the Web. The stabilization of this technology in a way that favored English speakers was just a paradigm, and one that could have been changed (and soon would change).

Furthermore, Lockard's argument is predicated on a core-and-periphery model that might be offensive to those living and working outside of anglophone, industrial countries. For instance, he dismisses the effort to bring other languages to computers. New Web browsing applications that can display languages other than English, he says, are limited in distribution and are more likely to be found outside of the countries where the non-English speakers live. Lockard states that software that claims to be polylingual is really just supporting English. Computers are programmed in machine languages that are based on English, making manufacturers' claims that their software is available in more than a dozen languages an example of "hegemonic culture." Lockard dismisses his contemporaries who claim that cyber-English is a kind of Trojan horse by which "denizens of powerless peripheries" may "subversively transform the center." Even though Lockard wonders why nonnative speakers are assumed to be desirous of flowing, complex English, he also portrays them as victims of an oppressive force. He displays the nomological account of Internet-enabled English vividly, particularly in the way he was unable to imagine a new paradigm of online communication.

At one point in his essay, Lockard veers into a normative account, although it is separated from using technology. The motivation for funding to sponsor worldwide English-language instruction, he writes, is to "reassure international capital [entities]" that they will have "a technologically competent labor force conditioned to passively accept the demands of capital[ism]," he writes. In this milieu, English is not an entry into a social world or a form of "self-actualization," but the "crushing" pressure of middle-class families to differentiate their children from the working class. Nevertheless, Lockard does not state this objection in terms of the normative power of technology. Instead, he makes an undeveloped

allusion to "Macaul[a]y's 1835 minute on Indian education that advocated civilizational English over vernacular culture." Here, he refers to the first faculties of English, which were established at universities by the British in nineteenth-century colonial India in order to teach Indian managers about British literature and culture so that they could be successful intermediaries between local workers and colonial administrators (Gupta 1995, p. 73). Those who love literature and the arts might assume that English language instruction would give students an entry into a world of beauty, independent thinking and social connections, but drawing a line from Thomas Macaulay to online English shows that not everyone has the economic and social privilege to discuss art for art's sake. Lockard does not return this critique to the prediction of the Internet's global English. He could have brought the normative account back to technology by writing, for instance, that the kind of English valued by the Internet, online English instruction, and machine translation is attuned to the commercial needs of transnational corporations that sponsored Internet connections in the dot-com era. This lapse accentuates the nomological notion that technology is separate from the social world.

An excellent example in the popular press of nonfiction literature making a nomological assertion about English is found in the *Atlantic Monthly* at the end of the dot-com boom. Like Lockard above, and Crystal below, Waldraff (2000) makes use of Airspeak as a metaphor for the influence of technology on language use. In order to ensure safe and easy communication among the world's airplane pilots and ground-control stations, a simplified form of English (i.e., Airspeak) is used. "Certainly, the world's ships and airplanes are safer if those who guide them have some language in common," she writes, but the problem comes when "anything out of the ordinary happens" (p. 60). For Waldraff, this is a lesson about the kind of communication enabled by technology. English speakers might anticipate that the Internet will foster robust conversation, but the reality will be that Internet-enabled English speakers will have only a functional fluency like that of airplane pilots and ship captains. For her, the growing use of English is just a corollary to the "accident" that the Internet was invented in English-speaking countries. Again, it can be seen that a

nomological account makes it seem like an external force favored English speakers, even though the theory of social construction makes it obvious that stabilization comes by selecting the technological solution that best meets social norms.

Waldraff presumes that, had the Internet come from Japan or China, English would no longer be expanding in the world. However, this disassociates technology from society. She suggests that advances made in mobile communication in Scandinavian countries might lead to an increase of worldwide speakers of Finnish, which did not come to pass. By the time of her writing, Internet users could use many languages thanks to Unicode. The paradigm of Internet English, though, still held sway. The twentieth century had seen considerable investment in English training from the U.S. and UK, following those countries' centuries-old ambition to make English a global language (see, for instance, United States Senate Foreign Relations Committee (1945) for a description of efforts in this regard). Even though there is nothing intrinsic about the English language that makes it conducive to discussions of science and technology, the cultural capital of the English-speaking world made this connection seem natural. English was subtly encoded in the Internet's code, certainly, but it also fit in with the already-existing expectations formed by decades of soft-power investments.

Nonfiction literature about technology-propelled English is not limited to the popular press. Cultural studies scholars similarly asserted their hope for a benevolent English regime without recognizing the nomological determinism inherent in their arguments. A universal language, states Godzich (1999), has long been a dream of philosophers, but it has become big business, earning astonishing sums for people in the U.S. and the UK. Speaking in French at an anglophone symposium in Tunisia about global English, Godzich recognizes that many speakers of English cannot understand each other; the British cab driver is an example of an English speaker who many find incomprehensible. Godzich predicts that a new language is on the horizon. Similar to a science fiction author, he states that the many varieties of English will coalesce into a single, simplified world

language for easy communication that should no longer be called *English:*

> II serait sans doute utile d'abandonner la dénomination d'anglais pour cette langue et l'appeler le "global". Le "global" se définirait comme la langue d'expression utilitaire adéquate pour toutes les activités à faible liaison locale. Son emblème serait la langue des présentateurs de la chaîne CNN dont on sait qu'ils viennent de tous les coins du globe et qu'ils sont soumis à de sévères contraintes linguistiques: … CNN est une transnationale qui ne reconnait pas de frontières (p. 33)
>
> It would probably be useful to abandon the appellation English for this language and call it "Global." "Global" may be defined as the language of utilitarian expression that is adequate for all activities that have a weak local connection. Its exemplar would be the language of CNN presenters, who one knows come from all corners of the globe and are subject to severe linguistic constraints: … CNN is a transnational entity that does not recognize borders.

The potential of this English that transcends borders is limited, in some ways, due to Godzich's adherence to the core-and-periphery model inherent in the English-propelled Internet. Rehashing an outdated idea, Godzich says that his "Global" is stripped of local contexts. Learning English for special purposes, like helping tourists or for staffing call centers, is not global English; this is "*l'anglais alimentaire*" – a subsistence or workaday variety of English that is not the worldwide language Godzich is looking for (p. 43). Like Crystal, Waldraff, and Lockard, Godzich notes that the global English needed to support a technological society potentially creates a divide between functional users of English and those with an advantage from studying a broader range of English. Along with other participants in the *boundary 2* symposium, one of Godzich's overall points is that this new English will not be monolithic or repressive. He uses the linguistic term "diglossia" in his title, referring

to the idea that a region might have a "high" standard language and a "low" spoken vernacular language. (Godzich's contemporary McArthur (1987) makes the example of Classical Latin, spoken by an elite, and the popular regional Latins that would become the Romance languages after the fall of the Roman Empire.) Like Crystal below, Godzich suggests a division among English speakers based on their language ability.

Although Godzich successfully demonstrates that English speakers will not be oppressed by technology-enabled global English (i.e., the nomological account), Godzich does not detail the way it will impact customs and practices (i.e., the normative account). Godzich and the other *boundary 2* contributors valorize the counterhegemonic strategies found in youth cultures that rely on an international English, but also demean those who enjoy wearing clothing with English slogans. They emphasize almost fetishistically the individuality that is possible through oral (unwritten, vernacular, "low" English) language under the umbrella of Global. Consequently, one wonders if speakers of utilitarian English will be afforded the same globetrotting flâneur status accorded to the contributors to the special issue. Indeed, Godzich uses the metaphor of the big bang to describe worldwide English, which to him suggests that it is expanding ever outward. The metaphor has connotations that Godzich does not mention, such as the tremendous, inevitable force that creates a new reality by destroying everything that existed previously. The elite speakers at the symposium seem unmolested by the devastating forces as they portray local people as able to use language only as a shelter.

Another limitation of the deterministic analysis of Godzich and the other writers for *boundary 2* is their failure to anticipate what would happen when the Internet became more widely available in Tunisia, the country that hosted their symposium. Based on the country's difficult relationship with the freedom of expression, it was not surprising that Tunisia would be one of the thirteen first called "enemies of the Internet" by Reporters Without Borders (2006). Deibert et al. (2008) note that Tunisia carried out a "focused, effective system of Internet control" (p. 398; this regime was active from 2001

to 2011). Deibert et al. detail the Internet censorship experienced within the country, where blocks against, e.g., dissenting voices and LBGTQ+ dating services were coupled with judicial attacks on journalists. The *vive la résistance* spirit that *boundary 2* saw in youth culture's counterhegemonic response to global English failed to anticipate this backlash or theorize a way to protect users from the violence that would be leveraged against those who used their voices.

The nonfiction literature reflecting English-only computing can also be found in linguistics scholarship, even though the current in the field had already turned away from the core-and-periphery model. One scholar writing about global English at the turn of the century was linguist David Crystal, who wrote *Language and the Internet* in 2001. By the time of this book's second edition (2006), he had to backtrack his sentiments from just five years earlier. Although the Internet "was originally a totally English medium," he writes in 2006, "the presence of other languages has steadily risen" (p. 229). The norms of the U.S. and the English-speaking world are implicit in Crystal's argument. For instance, Crystal celebrates the freedom of expression that the Web will occasion, bringing opportunities for many to present their ideas with a disregard for the niceties of proper grammar and good diction. When he writes about the legal challenges of the new medium, he focuses on copyright, a concern of the business-focused dot-com Web. Crystal suggests that electronic communication will support the freedom expression by breaking through barriers, which causes him to miss some important trends. He admires the creativity of webmasters of erotic websites who use innocuous words to evade the rudimentary Web filtering software available at the time. (This technique was also used to slip child pornography past automated censors.) Europeans, who appreciated commerce and the freedom of expression less and valued the protection of children more, were the first to demand that international websites localize their content to meet national laws that protected children and prohibited the sale of Nazi paraphernalia (see, e.g., Mangalindan & Delaney, 2000). Crystal's preoccupation with freedom of expression led him to miss the power of cultural norms in stabilizing a technological solution from its initial plurality, even

though as a linguist he had in fact studied the power of social norms in other contexts.

Crystal is a good example of an author who was influenced by the old paradigm of nomological revolution, which by this point had outlived its usefulness. The cultural capital that adhered to English is implicit in his dictum that "language is an immensely democratizing institution" (p. 172). The privilege inherent in this statement is contradicted by the anecdotes he reports. For instance, he notes the 1999 push by the prime minister of Singapore for the National Television Corporation to promote standard English over Singlish. This led to a storyline that sent a popular television character to school to make his English more like that of native speakers (2003, p. 175). Crystal also repeats a 1996 comment by U.S. Vice President Al Gore, who heard that "the 8-year-old son of Kyrgyzstan's former President Akayev" told his father he wanted to learn English "because the computer speaks English" (2006, p. 229, n. 36). Today, one would say that these anecdotes are an ill fit with ideals of democracy. The change of paradigm is evident in that, twenty years later, educators would not assert that one must abandon one's national language (and one's identity) because the languages of countries that are not among the world's most prosperous are incompatible with technology.

The special advantage accorded to technology during the dot-com boom is evident in Crystal's 1997 *English as a Global Language*. The book's early chapters describe how the economic and technological success of English speakers provided cultural capital that enforced the norms that led to the language's popularity. Here, he deftly notes how the prestige of English was increased by inventors in the U.S. and UK, as well as growth of those countries' economies (p. 81, ff.). This shows how English accumulated cultural capital by being the language of inventors, and Crystal also suggests that those wishing to obtain funding for their own work needed to speak the language of their investors. The first part of the book demonstrates a normative analysis, but like Lockard (above), this approach is lacking when Crystal turns to a discussion of Internet technology, showing how the dream of the disruptive potential of the Internet tricked even established scholars. By the time of the book's second edition (2003),

he admits that speakers of languages other than English have been coming to the Internet. Despite this caveat, he still maintains his conviction that technology was driving English use: "the head start English has had means there is more high-quality content on the Web in English than in other languages" (p. 119). He predicts that a new standard English for worldwide communication will spread around the world (p. 148). Local, richer varieties that are not mutually intelligible will proliferate, and communities of English speakers will communicate using a utilitarian, simplified English.[6] This is not so different from other authors' suggestions that those who have advanced reading and writing ability at the core are superior to those who work with regional varieties at the periphery.

Today, members of various language communities engage in complicated discussions in English about subject areas that are important to them, and their vocabularies are rich enough, even if their grammar may be lacking and their vocabularies in other areas might be less developed. Participating in social media, discussion boards, and other Internet-facilitated communication, one can see detailed conversations in areas that netizens are passionate about. People engage in robust conversations in English with those who share their interests in popular music, television, movies, and streaming series; fighting climate change; discussing anime and manga; fighting for social justice, and so on. The vision of a homogenized, streamlined business English is, to be sure, the kind of communication valued by users of the Web, e-mail, blogs – not to mention what some educators anticipated their students would use for careers using these media. However, that is a stylistic norm. In other words, the fact that some international communicators value short, direct conversations with crisp English usage has not prevented others from expressing their love for post-impressionist painting, Taylor Swift, green lifestyles, *et cetera*.

[6] In recent years, Crystal (2022) has said that the norms of the language have changed: Internet-enabled communication brings speakers of varieties of English into contact with each other. As a result, he says, today's English educators must prepare students for a multilingual world.

As noted by STS scholars like Shapin and Schaffer, it is not helpful to say that the losers of a debate were mistaken. The failure of turn-of-the-century authors to appreciate their own cultural capital led them to assert utopian potentials. From this position, they were unable to predict the conflict between technology and culture that would result in an effort to protect local ideologies. The response to the threatened norms was not, after all, a nomological discussion about the harmful, universal, and inevitable impacts of Internet-enabled technologies or even a rejection of the technologies. Instead, policymakers in Tunisia (and in so many other countries) directed engineers to block content that did not support national ideologies. These authors had considered the technology to be stabilized and that its use would match their own expectations, but policymakers and engineers used the technology in a different way. The dichotomy implicit in debates over nomological approaches is inadequate for addressing these developments.

**Alternatives to the nomological approach**

The authors of nonfiction literature who steered clear from the nomological analysis of the relationship of the Internet and English are scarcer, but they did publish during the dot-com boom or shortly thereafter, suggesting that the nomological approach found in most literature was not the only way people were thinking.

An article by linguist Yukio Tsuda (1999) demonstrates the difficulty in finding other voices. Tsuda often relies on a nomological viewpoint, which hinders appreciation for his normative analysis. Writing at the height of the dot-com boom, Tsuda replicates the core-and-periphery argument noticed earlier, worrying how English proficiency had become something of a proxy for international power:

> native speakers of English reign as a prestigious ruling class of international communication: they can easily express their ideas any time, while non-native speakers and people who do not speak English constitute the ‘muted’ working class of international communication: they are

> compelled to learn English and have difficulty expressing their ideas. This is what I call the 'Class Structure of International Communication' on the basis of proficiency in English. (p. 156)

Tsuda goes to some length to say, though, that technology and worldwide English are not independent forces of nature. As an example, Tsuda refutes those who claim that messages of freedom caused the fall of the Berlin Wall in 1989. This analysis runs contrary to cyberoptimists like Hauben and Hauben (1996) who proclaimed that the Internet was a great equalizer. Hauben, the author who coined the term *netizen*, radiates enthusiasm for the transformation technology would bring to the "the people of the world," without thinking about people who do not speak English. Hauben asserted the Internet offers a new means for "peaceful assembly," which "allows for people to take control over their lives, rather than that control being in the hands of others." Hauben and Hauben (1998) and others promoted the notion that the Berlin Wall fell because of "increased communication" provided by the Internet. As pointed out by Tsuda, though, the Wende was a result of unequal authority between East Germany and Moscow, not people using satellites, personal computers, and the Internet to discuss freedom.

The normative power of the paradigm that the English-Internet is an opportunity for freedom is countered well by Tsuda. The example he uses is a shift in information policy. In the 1970s, the United Nations had demanded a "New World Information and Communication Order" to address the fact that just a few communication centers were responsible for providing the majority of news and information to the world's population. The UN asserted that confronting this consolidation of information networks was essential to support worldwide economic development, but, as Tsuda says, it was ignored by the U.S. and the UK, two of the beneficiaries of the oligarchic communication regime. The situation worsened with the advent of the Web, according to Tsuda, because the metaphor of the Information Superhighway lessened interest in information policy seeking to address imbalances in the creation of news content (p. 161). In other words, the dream of the disruptive and penetrating

potential of universal Internet-enabled technologies sidelined the discussion about information inequality. Scholars like Godzich (above) had described CNN as an irresistible force of global English, but Tsuda points out that this dominance was and still could be critiqued and ameliorated.

Another author of nonfiction literature who deftly avoids a nomological interpretation is Rita Raley (2003), who has an expertise in cultural studies. She points out how the technical limitations and the user expectations of translation software are likely to loop back onto language use. The facile dreams of machine translation, Raley points out, match with the already outdated idea that one language can readily be transformed into another. Translation, Raley reminds her readers, has already been proven to be less than transparent, no matter what those writing about machine translation like to think: the solution is not as simple as connecting a series of automatic algorithms. There is an ethical problem here, she points out, because the dream of transparent translation eliminates "extra-linguistic" factors, "privileging grammar over rhetoric." At the same time, the myth of transparent translation disregards linguistic differences, with the output seemingly free from ambiguity (pp. 293-294). For Raley, global English and machine translation spring from a common source: technocracy. This common ancestor reinforces norms like "functionality and efficiency" (p. 307). As a result, users tend to think that understanding is uncomplicated, aspirations are universal, and cultural differences are irrelevant. Unlike someone trapped in a nomological mode of analysis, Raley does not reject machine translation nor seek a refinement to the innovation. Instead, she calls for an intervention from the "critical humanities" (p. 292) that will make users aware of the limitations of the tools they use. The normative account helps her to break through paradigms and human values are at the center of new technologies, even ones that seem to be already stabilized.

**Opportunities to foster CMLA**

When considering literature that predicted the global spread of English caused by the Internet at the end of the 1990s, one can see that writers were mostly caught in a dichotomy between two poles of nomological accounts. Some asserted that one-sided, uniform social change was imminent, while others suggested that this dire outcome was overstated. Just a few suggest that the most important aspect is the way technology is used to support norms, which might be unfavorable. These insights point the way to pedagogical and research innovation.

With respect to the first research question, it is clear from the preceding analysis that those following nomological determinism (whether or not technology imposes changes on society) failed to anticipate the future outcome. As predicted by the STS theorists, the alternative to technological determinism is social constructivism, or what Bimber calls the normative account. Certainly, those with a better understanding of the social construction of technology, like Tsuda and Raley, anticipated what was to come when Internet technology collided with social norms. Those espousing the nomological approach failed to predict that the Web and Internet-based technology would not meet their exuberant, boundary-breaking predictions. Countries quickly became adept at blocking content that did not meet their ideological beliefs or legal standards; they modified the English-dominated Internet so that it did not pass across borders unchecked.

Following from this, it is clear that the better understanding gained from the study of nonfiction literature about technology can improve writing about technology and help those considering pedagogies that involve new technology. Although it seems that technology leaves users few options – accept the negative consequences or go without – this is a rhetorical position that ignores the very real interplay between technology and society. A normative account allows readers to see the compelling rhetoric as an effort to make users forget the role they play in how technology is used. This insight can be transformed into action in practical ways. For instance:

1. One finding related to the second research question is that the normative approach has an important role in education. Bringing these primary sources into the classroom can help students learn about the fallacy of technological determinism. In the metaphors used by authors who employ nomological determinism, humans seem adrift in the onslaught of technological change. In their view, technology develops according to its own internal logic, independent from society, and users adapt to new devices or reject them. This simplistic interpretation denies the role that users have in adapting technology in a way that suits not just their personalities but also fits in with their aspirations and ideals. The long story of the development of the Internet, after all, is a series of unintended developments: Abbate (1990) has stressed that the original intentions of Internet innovators often failed to be welcomed by users, who unexpectedly embraced features that were thought to be unimportant, like e-mail. Nonfiction literature that is fixated on a discussion of nomological determinism tends to deny the influence users have via technology choice. As noted by Kuhn, understanding new information can be difficult in a period of normal science because the old paradigm explains away aberrant information. Until the paradigm shifts, it is hard to accept new ideas. The experience of a paradigm shift can be hard to come by, but it can be imparted vicariously through the study of nonfiction literature.

2. The analysis of nonfiction literature elucidates how educators should resist pedagogies aimed at preparing learners for communication in "Global" because they are based on an inappropriate understanding of the connection between technology and society. This fits in with the third research question related to CMLA. Many authors predicted that technology choice would inevitably cause a two-tier outcome, with the majority of the world's speakers relegated to practical English. Although this paper has focused on

nonfiction literature about technology, its implications can be felt in the selection and use of other types of literature in the classroom. For instance, Godzich, in an illustration of his idea about global English, suggests that the novels of Paul Auster are accessible to a wide range of readers, making them now more preferable to the novels of Toni Morrison, which introduce readers to a secret world. Due to the failure of this prognosis, other pedagogies must gain support. Respecting how language use reflects rich local traditions and showing learners how to develop specialized vocabularies seems more relevant than ever. Overcoming the presumption of the prevalent and persuasive core-and-periphery paradigm then becomes a pedagogical goal: international audiences at the so-called periphery can comprehend deeply, and indeed must be accustomed to dealing with complexities of understanding outside the supposed core.

3. This historical insight gained from normative approaches is also helpful for authors of new nonfiction literature about technology, as well as educators considering the use of technology as part of their pedagogies, which is another response to the third research question. When technological innovations enter into the popular imagination, it seems likely that a nomological discussion will be first and most prominent. In conversations about the classroom use of generative AI, like ChatGPT, nomological predictions that the technology will inevitably cause cheating or cause a loss of creativity seem prominent. However, less appreciated is how answers provided by generative AI will shape expectations about writing and knowledge. Asking students not to cheat and punishing them may not be successful unless both teachers and students address the norms that make generative AI output seem appealing. A normative investigation can reveal the limitations of generative AI's output. Given the fact that AI is often trained by material that is already in digital form, and that information is imbricated

in assumptions formed in the industrial, global north, AI-generated answers show a bias. Even though the dot-com boom is over, the norms from this era persist. As a result, the ideals of the Internet's global English have already led users to think that the corporate bias from the global north is normal. Without educational interventions that reveal normative determinism, the use of generative AI is likely to continue to exacerbate allegiance to this bias. Normative insights like the ones that come from the application of STS theory in this paper can better guide educators and authors who aim to use and analyze technology.

4. As an additional answer to the third research question, educators interested in fostering CMLA can bring the late-twentieth century primary sources that predicted global English into the classroom. Using insight from the normative approach, language learners and educators can benefit from the understanding that the interaction between technology and society is not like an outside force making unilateral changes. Instead, failed predictions like the ones described in this paper show how technology use validates certain kinds of social practices and degrades others. This does not mean that the social world supports the same values and belittles the ones favored by a particular technological solution. However, it can be an occasion to situate language learning, investigate biases related to cultural capital, and reconsider which values are the most important in communication.

Developing an awareness of normative technological determinism, then, can lead to effective pedagogies as well as research questions related to the way technologies are used and how their use might make individuals forget that a technological solution is just one option among many possibilities.

## Conclusion

During the dot-com boom, nonfiction literature about the impact of the Web and other Internet services suggested that technology would diminish the use of languages other than English. This debate was rooted in discussion of technological determinism, but only of a certain type: whether or not technology unilaterally and uniformly transforms societies. The theory that the Web and other Internet-based technologies would favor English and forestall use by other language users is obviously incorrect, but the debate reveals technology's role in determining norms. Reading nonfiction literature with this background in mind can yield to a better understanding of the connection between technology and society for authors, researchers, and students.

## Acknowledgement

An earlier version of this paper was presented at the "Liberal Arts in the Role of Cultural Capital" conference, the 1st International and 8th National Academic Conference on Humanities and Social Sciences sponsored by Mahidol University's Faculty of Liberal Arts. The author is grateful for the comments and advice from the conference committee, panel respondents, peer reviewers, and other colleagues.

**References**

Abbate, J. (1990). *Inventing the Internet.* MIT Press.

Bimber, B. (1994). Three faces of technological determinism. In Merritt Roe Smith & Leo Marx, (Eds.), *Does Technology Drive History? The Dilemma of Technological Determinism*. (pp. 79-100). MIT Press.

Crystal, D. (1997). *English as a Global Language*. Cambridge.

Crystal, D. (2003). *English as a Global Language*, (2nd ed.). Cambridge.

Crystal, D. (2006). *Language and the Internet*, (2nd ed.). Cambridge.

Crystal, D. (2022). What's new in the English language? Kasetsart University, https://www.youtube.com/watch?v=IMJOzvD9nNA

De Costa, P., & Van Gorp, K. (2023). Centering critical multilingual language awareness in language teacher education: towards more evidence-based instructional practices. *Language Awareness*, *32*(4), 553-559.

Deibert, R., Palfrey, J., Rohozinski, R., & Zittrain, J. (2008). *Access Denied. Practice and Policy of Global Internet Filtering*. Cambridge, MIT Press.

Dvorak, J. (1992, September 15). Kiss your ASCII goodbye. *PC Magazine*.

Ellul, J. (1970). *The Technological Society*. Trans. John Wilkinson. Knopf.

García, O. (2017). Critical multilingual language awareness and teacher education. In J. Cenoz et al. (Eds.), *Language Awareness and Multilingualism* (3rd ed.). (pp. 263-280). Springer Cham.

Godzich, W. (1999). L'anglais mondial et les stratégies de la diglossie. *boundary 2, 26*(2), 31-44.

Gupta R. (1995). English in a postcolonial situation: the example of India. *Profession, 1995*, 73-78.

Hauben, M., & Hauben, R. (1996). *Netizens Netbook.* http://www.columbia.edu/~hauben/book-pdf/

Hauben, M., & Hauben, R. (1998). The evolution of Usenet, the poor man's ARPANET. *First Monday*, *3*(7). https://cybra.lodz.pl/Content/1081/issues/issue3_7/chapter2/index.html

Hacking, I. (1999). *The Social Construction of What?* Harvard UP.

Hélot, C., Yoshimura, M., & Young, A. (2018). Educating English language teachers to critical language awareness: a collaborative Franco-Japanese project. In *International Perspectives on Critical Pedagogies in ELT*. (pp. 197-217). Springer International Publishing.

Hjarvard, S. (2003). The globalization of language: How the media contribute to the spread of English and the emergence of medialects. *Nordicom Review, 25*(1), 75-97.

Hughes, T. (1983). *Networks of Power: Electrification in Western Society, 1880-1930.* Johns Hopkins University Press.

Kachru, B. (1991). World languages and applied linguistics. In Tickoo, Makhan L., ed.: *Languages and Standards: Issues, Attitudes, Case Studies*. (pp. 178-207). Southeast Asian Ministers of Education Regional Language Centre.

Kroskrity, P. (2010). Language ideologies: evolving perspectives. In *Society and Language Use*, Jürgen Jaspers, Jan-Ola Östman, and Jef Verschueren, eds. (pp. 192-211). John Benjamins.

Kuhn, T. (1970). *The Structure of Scientific Revolutions.* U Chicago P.

Latour, B., & Woolgar, S. (1986). *Laboratory Life: The Construction of Scientific Facts,* (2nd ed.). Princeton UP.

Leslie, C. (2016). Flame wars on Worldnet: early constructions of the international user. Arthur Tatnall and Christopher Leslie, eds.: *International Communities of Invention and Innovation. IFIP Advances in Computing Technology 491*. (pp. 122-140).

Leslie, C. (2023). *From Hyperspace to Hypertext: Masculinity, Globalization, and Their Discontents.* Palgrave Macmillan Singapore.

Levine, R., & Gustafson, S. (2022). *The Norton Anthology of American Literature, Tenth Edition; Volume A: Beginnings to 1820.* W. W. Norton.

Lockard, J. (1996). Resisting cyber-English. *Bad Subjects 24 (February)*. https://web.archive.org/web/19970101080116/http://english-www.hss.cmu.edu:80/BS/24/lockard.html

McArthur, T. (1987). The English languages?. *English Today, 3*(3), 9-10.

McLuhan, M. (1962). *The Gutenberg Galaxy: The Making of Typographic Man.* University of Toronto Press.

Mangalindan, M., & Delaney, K. (2000, Nov. 21). French court orders Yahoo! to block sale of Nazi items. *The Wall Street Journal*.

Nunberg, G. (2001, Dec. 19). Will the Internet always speak English? *The American Prospect.* https://prospect.org/features/will-internet-always-speak-english/

Pakir, A. (1999). Connecting with English in the context of internationalisation. *TESOL Quarterly, 33*(1), 103-114.

Raley, R. (2003). Machine translation and global English. *The Yale Journal of Criticism, 16*(2), 291-313.

Reporters Without Borders. (2006). List of the 13 Internet enemies. https://web.archive.org/web/20110430050508/http://en.rsf.org/list-of-the-13-internet-enemies-07-11-2006,19603

Shapin, S., & Schaffer, S. (2011). *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life.* Princeton UP.

Specter, M. (1996). World, wide, web: 3 English words. *New York Times* (April 14), sect. 4, p. 1. https://www.nytimes.com/1996/04/14/weekinreview/computer-speak-world-wide-web-3-english-words.html

Todd, L. (1999). Global English. *English Today*, *15*(2), 30-31.

Tsuda, Y. (1999). The hegemony of English and strategies for linguistic pluralism: proposing the ecology of language paradigm. In *Worlds Apart: Human Security and Global Governance*, Majid Tehranian, ed. (pp. 153-167). IB Tauris.

United States Senate Foreign Relations Committee. (1945). *First Session on Making English a World Language*. Government Printing Office.

Waldraff, B. (2000). What global language?. *The Atlantic Monthly*, *286*(5), 52-66.

Williams, R. (2008). *Television*. Routledge.

Yates, S. (1996). English in cyberspace. In Sharon Goodman and David Graddol, eds. *Redesigning English: New Texts, New Identities*. (pp. 104-144). Routledge.

**Author**

Christopher Leslie
Lecturer, Faculty of Liberal Arts, Prince of Songkla University
E-mail: christopher.l@psu.ac.th