BERNARD STIEGLER ON A UNIFIED VISION OF HUMANITY AND TECHNOLOGY IN EDUCATION: AN ANALYSIS OF HUMAN/TECHNICAL IDEOLOGY IN THE WRITINGS OF TODAY'S MOST INFLUENTIAL EDUCATIONAL LEADERS

Dissertation

Submitted to

The School of Education and Health Sciences of the

UNIVERSITY OF DAYTON

In Partial Fulfillment of the Requirements for

The Degree of

Doctor of Philosophy in Educational Leadership

By

Russell Alan Thomas, MA, MCSE, MCT

UNIVERSITY OF DAYTON

Dayton, Ohio

May 2019

BERNARD STIEGLER ON A UNIFIED VISION OF

HUMANITY AND TECHNOLOGY IN EDUCATION:

AN ANALYSIS OF HUMAN/TECHNICAL IDEOLOGY IN THE WRITINGS OF

TODAY'S MOST INFLUENTIAL EDUCATIONAL LEADERS

Name: Thomas, Russell Alan

APPROVED BY:

_____

Thomas M. Falk, Ph.D.
Committee Chair

_____

Charles J. Russo, J.D. Ed.D.
Faculty Advisor

_____

John White, Ph.D.
Faculty Advisor

_____

Andrew Slade, Ph.D.
Faculty Advisor

_____

Kevin R. Kelly, Ph.D.
Dean, School of Education and Health Sciences

ABSTRACT

BERNARD STIEGLER ON A UNIFIED VISION OF HUMANITY AND TECHNOLOGY IN EDUCATION: AN ANALYSIS OF HUMAN/TECHNICAL IDEOLOGY IN THE WRITINGS OF TODAY'S MOST INFLUENTIAL EDUCATIONAL LEADERS

Name: Thomas, Russell Alan
University of Dayton

Advisor: Thomas M. Falk, Ph.D.

This study explores the meaning, effect, and prevalence of two contrasting ideological perspectives about technology: Technological Determinism and the unified/humanizing view of technology espoused by French philosopher, Bernard Stiegler. The study addresses the long-held concerns that so many have had about the problematic effects of Technological Determinism on educational policy and practice and explains how the embrace of Stiegler's view of technology serves as a remedy. The study examines the ways in which Technological Determinism manifests in discourse and the presence of its underlying characteristics in the writings of today's most influential educational leaders. The study's findings give credence to the concerns of the normalization of deterministic ideology in educational discourse; that, irrespective of a scholar's bias for or against, and integrated or dis-integrated view of technology, a characteristic foundational to deterministic thinking; namely, the granting of agency, is present.

I dedicate this to my wife.

without whom, I am nothing …

ACKNOWLEDGEMENTS

It was often hard to like Dr. Watras. It was, however, very easy, to respect him. I found myself thinking of him as my *Academic* Drill Instructor. After graduating *Marine Corps* boot camp, I did not much like them either. Yet, just as with them, Dr. Watras molded me and lifted me up. He was my Socrates and I his honored peripatetic. Only he can truly know how much he means to me. I hope that my efforts here make him proud.

After the passing of Dr. Watras, I thought I would never pass beyond Candidacy. Dr. Falk showed his willingness to step in at a grim time to make my dream of achieving a doctoral degree, a reality. I am deeply in his debt.

PREFACE

On first encountering the works of Bernard Stiegler, three things immediately come to mind. The first is the depth and breadth of Stiegler's knowledge that covers a wide range of subject areas including history, philosophy, technology, geo-politics, commerce, and education. The second thing found in Stiegler's works is an obvious anxiety about today's individual and society as they endeavor to deal with a continual increase in technical knowledge and technological innovation. Third, and equally as evident, is a sincere and forceful acknowledgement that all hope is not lost, and that there is something that *we*, as educators, should be doing to address the concerns he poses. Stiegler's ideas have been influenced heavily by his reading of the *Discourses* of Epictetus, wherein he writes, "Men are disturbed, not by things, but by the principles and notions which they form concerning things" (135 A.C.E., § 5). It is from this understanding that Stiegler points us to the 'principles and notions which *we as educational leaders* form concerning technology.'

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER I

INTRODUCTION

> *The normative status of technology is now contentious. Some view it as a savior, capable of solving most of the perennial problems of human existence; others view it as a demon that threatens the health of human society and the environment. Some argue that a felicitous future will only be possible with continually increasing technological growth; others plead for the rejection of technology, arguing that it is intrinsically destructive. […] my purpose is to recognize the contentious role of technology in society and to explore some of the implications this has for semantics in the field of technology studies*. (Willoughby, 2004, p. 13)

This study explores the meaning, effect, and prevalence of two contrasting ideological perspectives about technology: Technological Determinism and the unified/humanizing view of technology espoused by French philosopher, Bernard Stiegler. It addresses the long-held concerns that so many have had about the problematic effects of Technological Determinism on educational policy and practice and explains how the embrace of Stiegler's view of technology serves as a remedy. This study then examines the ways in which Technological Determinism manifests in discourse and uses this to identify its presence in the writings of today's most influential educational leaders.

The Problem of Technological Determinism

Technological Determinism is the philosophical perspective that asserts technology has the power to influence human life. Those holding a deterministic view of technology assume that technology is an independent, self-governing force acting outside of human control that drives society and culture (Lemmens & Stiegler, 2011; Oostveen, 2007; Strobel & Tillberg-Webb, 2008; Webster, 2013; Wiesemes, 2009). Adler offers a less complex definition: "Technological Determinism, simply put, is the idea that technology has important effects on our lives" (2008, p. 1085). Adler explains that a technological determinist might, for example, believe that the Internet is revolutionizing the economy and society without the involvement of humans.

With Technological Determinism, technology alone is thought to have a serious effect on "social roles and relations, political arrangements, organizational structures and cultural beliefs, symbols, and experiences" (Brey, 2003, p. 53). An example of Technological Determinism's impact can be found in Winner's (1980) claim that technologies affect public life because they are inherently political. Wajcman (1991) agrees, but goes on to argue that technology's political bent is related to gender bias.

Technological determinists assume that technologies control the behavior of their users (Latour, op. 1992; Sclove, 1995). Latour (op. 1992) uses the example of ordinary technologies like the seat belt, hotel keys, and the common door to explain this. If one were unaware of how a door works, he explained, the door would eventually 'teach' its user that to pass through it a doorknob must be turned. Even the common sofa chair, Sclove (1995) argues, perpetuates an emphasis in the Western culture of individuality and privacy in that it causes the individual to sit separate from others.

Winner (1980) gives the example of a nuclear power plant to explicate the effects of a deterministic view of technology, explaining that a structure of this type, by its very nature, necessitates a carefully designed managerial social structure to be set in place around it. And, Turkle (1984) explains that computerized toys influence the way children think about what it means to be 'alive' because the toy's 'ability' to mirror human behavior causes children to reassess traditional conceptions of life. In these examples, the technological determinist assumes it is the technology that is shaping individual and collective thought and practice.

Technological Determinism is reductionist in nature and because of this, it oversimplifies the complexity of technology implementation (Cuban, 2001; Strobel & Tillberg-Webb, 2008). This oversimplification can have a number of problematic effects on technology use and administration including increasing the prospect that end users will be disappointed by its efficacy (Cuban, 2001). Strobel and Tillberg-Webb (2008) argue that simplistic views of technology are often accompanied by Utopian or Dystopian beliefs about technology.

Technological Utopianism is an embrace of the promise of technology. Those who hold to a Utopian view of technology see advances in technological innovations as advantageous; a positive move forward to a social and cultural world that emphasizes democracy and equal access to technologies and technological infrastructures. The effect of this progress, they believe, is a liberation through increases in efficiency and productivity. Utopianists look to technology as the answer; as the 'technological fix' (Borgmann, 1988).

Technological Dystopianism, on the other hand, is an ideological perspective in

which technologies have taken control in a way that is counterproductive to human existence (Oostveen, 2007; Strobel & Tillberg-Webb, 2008). It is the negative imposition of the technological as in Orwell's *1984* (ca. 2002), where innovation has run amuck. In a similar manner, Postman (1992) writes of a world in which all aspects of human society and culture have been redefined by the technological and any flaw, be it in religion, art, politics, or elsewhere, are amplified. The Dystopianist, unlike the Utopianist, sees technology as a force acting on humanity, dragging it down rather than lifting it up, increasing rather than decreasing the divisions between those who have and those without (Powell III, 2001; Schement, 2001).

All of this is to say that Technological Determinism is by its very nature, problematic. Moreover, the deterministic view of technology represents the foundation of broader philosophical perspectives, like Utopianism and Dystopianism, where the technological is seen as the ultimate source, either beneficial or detrimental, of societal joys or woes. Both the deterministic Utopianism and Dystopianism are equally troublesome when it comes to the embrace of technologies, especially when it comes to its use in educational administration.

The technological determinist in education believes that technology is a "powerful and autonomous agent that dictates" (Pfaffenberger, 1988, p. 239) the success and/or failure of learning, instruction, and institutional operations. Technological Determinism is considered problematic in education for several reasons. The primary reason is the impact that deterministic thinking about technology has on the question of responsibility. Today's understanding of Technological Determinism's effect on responsibility was first emphasized in the early- to mid-20th century by widely respected scholars such as

Jacques Ellul and Merton (1964).

Hofmann (2006) explains that because technology is assumed to be in control, educators are not actually the ones responsible for making decisions about technology use. Hofmann questioned that, "if we really are determined by technology in one way or another, it must mean that we have less responsibility for technology" (2006, p. 2). Earlier, Pannabecker (1991) ask a similar question about Technological Determinism's tie to responsibility but in this case, related it to free will. "If everything is determined by previous events and conditions, then humans could have little choice or responsibility for what happens" (1991, para. 9). Also relating deterministic thinking about technology to responsibility, Wiesemes (2009) points to the influence that Technological Determinism can have on the perceived value of technologies used in education. Wiesemes explains that, because technology is seen as the cause for the changes that occur in the classroom, deterministic views of technology tend to minimize the apparent value of the work of teachers.

Miller (1997) also points out that technological deterministic assumptions ultimately result in a loss of human involvement with technologies. Because of this, there is a tendency for those who make decisions about technology use to look first to solutions involving technologies (Strobel & Tillberg-Webb, 2008). Moreover, "because technology is the end result of our thinking, the technological fix can, however, only serve to displace problems" (Miller, 1997b, p. 58).

A Brief Introduction to Bernard Stiegler

> Stiegler is in many respects a fairly traditional continental philosopher, an heir to Nietzsche, Husserl, Heidegger, Foucault, and Derrida and deeply affiliated with the traditions of phenomenology, psychoanalysis, and deconstruction. The originality of his work resides first of all in a Heideggerian-like rethinking of the entire Western philosophical tradition on the basis of its systematically forgotten technical condition. (Lemmens, 2011, p. 33)

Stiegler's importance to this study became clear throughout its writing where his ideas were repeatedly found to be relevant. The most important of these is his focus on the cause and effects of deterministic thinking about technology. For this reason and many others, Stiegler's ideas display prominently in the following literature review.

One example of these ideas is Stiegler's continued argument that there is a direct link between the way individuals express their ideologies about technologies and the ultimate effectiveness of their use; thinking that flows from the views of a line of contemporary French philosophers who hold to what scholar Ian James, in his 2012 work entitled *The New French Philosophy*, calls *linguistic materialism*, "a concern for the materiality of discourse, of language, and of the symbolic which might then form or inform material practices" (2012, p. 12).

The idea of a relationship between language and practice began for Stiegler when he became seriously interested in the study of philosophy during a period of incarceration. In 1978, Bernard Stiegler entered the grounds of the *Prison Saint-Michel* in Toulouse, to serve a five-year sentence for armed robbery. Stiegler would dedicate this

time to self-introspection and to the writings of various scholars about what it means to be human in a world inundated by new technical knowledge and innovation.

It would take an additional 15 years from the completion of his five-year incarceration for Stiegler to be able to put into words what he had come to understand about the nature of humanity and its inseparable relationship to technology. This two-decade period, from his initial sentencing to his initial contribution as a philosopher and scholar has been crucial in the development of his core beliefs about technology. In the first book of his most notable work, the three-volume *Technics and Time, 1: The Fault of Epimetheus* (1998), Stiegler puts great detail to the views he has now come to hold and endorse, and that would become the central theme of his works to follow.

Stiegler's research on the relationship between humanity and technology began in earnest during his period of incarceration between 1978 and 1983 that he writes of in several telling, autobiographical texts. These works give us great insight into the developing thinking of Stiegler as he went through the transformative process of becoming a philosopher. The most prominent of these self-reflective texts is his book, *Acting Out* (Stiegler, Barison, Ross, & Crogan, 2009) that is made up of the French to English translations of two of his earlier writings:

How I Became a Philosopher, outlines the transformation that Stiegler underwent from layperson to philosopher and eventually, activist. Stiegler's introduction during that time to Ancient Greece's earliest theories about humanity and technology would ultimately become a catalyst leading him to the formal study of philosophy, technology, and a myriad of other subjects under the instruction of notable scholars like his mentor Jacques Derrida. The second part of *Acting Out* (Stiegler et al., 2009), on the other hand,

is taken from the translation of, *To Love, To Love Me, To Love Us*, that describes Stiegler's views of the contemporary world as it struggles against a destructive consumerism brought on in great part by society's inability to conceive of and embrace today's technological advances.

Stiegler was able to develop his philosophical understandings due in great part to the efforts of among others the long-established philosopher, Gérard Granel, who would facilitate Stiegler's transformation. Granel is renowned for his French translations of works by Martin Heidegger, Edmund Husserl, David Hume, and others and his influence on the likes of Jacques Derrida and Jean-Luc Nancy. Stiegler discusses Granel's involvement in his transformation while in prison in a lecture he would later give in London entitled, *Towards a European Way of Life* (2008) in which he offers tribute to Granel's assistance with his correspondence studies at the *Université de Toulouse-Le-Mirail* where Granel was Professor of Philosophy.

Having the 'freedom' to dedicate himself to study while in prison, the would-be scholar immersed himself in philosophy, especially the works of the Greek stoics. One of these stoic philosophers mentioned by name in his writings is Epictetus who would have an important influence on the way Stiegler carried out his daily routines while in prison and, in turn, on the development of his basic concepts about philosophy. In fact, we can learn a great deal about Stiegler's current views about philosophy by looking at those of Epictetus.

> Here you see the beginning of philosophy, in the discovery of the conflict of men's minds with one another, and the attempt to seek for the reason of this conflict, and the condemnation of mere opinion, as a thing not to be trusted; and a

> search to determine whether your opinion is true, and an attempt to discover a standard, just as we discover the balance to deal with weights and the rule to deal with things straight and crooked. This is the beginning of philosophy. (1916, p. 302)

Epictetus was especially influential to Stiegler in his discussions of the meanings *behind* reality.

In keeping with Epictetus' claim, Stiegler's efforts would come to emphasize the importance of our *conceptions* of technology, those 'principles and notions,' as opposed to merely the *physical* technologies that we encounter. In his, *Review of Acting Out by Bernard Stiegler* (2011), Maxwell Kennel identifies the emphasis of the conceptual or theoretical as an important element of Stiegler's views that can be found in the differences between the two essays that makeup *Acting Out*. Kennel explains that, "whereas the first essay deals with the link between Stiegler's philosophy and his biography, the second puts the link between theory and appearances into practice" (2011, p. 249). Together the two texts combine to make the book one of the many examples of Stiegler's works that unite the *theoretical* and *material*.

As important to the development of what would underlie Stiegler's understanding about the nature of humanity and technology is the daily routine to which he would submit himself during his time of incarceration. This routine, that Stiegler appropriately named after the mythic Greek muse of contemplation, *Melete,* is best described in his work, *Philosophizing by Accident* (2006). Here, Stiegler recalls the details of how he structured his prison days and what this structure meant to his arriving at a new realization about the nature of humanity and the world around it.

> I would, for example, throughout those five years, begin each day by reading Mallarmé. […] Reading a poem or, reading and re-reading a prose text, usually for half an hour, not so as to learn it by heart, but to *understand* it. More generally, my *Melete* came from readings leading to prolonged writing exercises in different modes, which came to form veritable reading-methods, which consisted in a process in which the texts read were catalogued, then transformed into commentaries, and finally consisted of writing, in which these remains of the world were reassembled: thus was *produced* reminiscence. (2006, p. 105)

When looked at more closely, it becomes apparent how foundational this transformative process would eventually become to the establishment of many of Stiegler's views. For example, the daily readings of the works of Stéphane Mallarmé that he mentions above, would help to reinforce a developing emphasis on the importance of the *symbol*. Stiegler goes on to explain its importance in his discussion of the signifying qualities of language.

> I lived only in language, and uniquely in written language. […] Language, in abandoning its communicative function, opened itself fully to its significance, or as significance, as if it turned itself over to its vocation of signifying, suddenly proliferating. (Stiegler, 2006, p. 105)

When Stiegler writes of language as having the 'vocation of signifying, suddenly proliferating,' he is saying that language, when expressed in the form of writing, print, or digital media represents *thoughts materialized*. They are a type of 'produced reminiscence,' an expressed memory that perpetuates or 'proliferates.' Stiegler refers to

these manifestations of thought or memory that we leave behind in this way as *mnemotechnics*.

It would take an additional 15 years from his release from prison for Stiegler to make a complete connection between language and practice and to fully comprehend how ideas about technology are perpetuated through physical representations of discourse or, writing, print, and digital media. During this time, Stiegler would finish developing his own ideology of the human/technical connection. This included the development of several sophisticated concepts and coined words and phrases that Stiegler has used to clarify his newly found understandings; all of which are introduced here and discussed in detail below. One of the most important concepts that Stiegler discusses has to do with humanity's technological origins that he calls, *epiphylogenesis*[1]. Other concepts have to do with human expression through technology as *exteriorization* and technology's *pharmacological* nature. Stiegler would begin perpetuating these views through his own *mnemotechnics* in the form of his opus, *Technics and Time 1: The Fault of Epimetheus* (1998).

Stiegler's continual efforts to identify and eradicate Technological Determinism

---

[3] To many, one of Stiegler's most effective and 'frustrating' traits has been to coin terms and phrases throughout his body of works to allow for the defining of ideas yet undefined. This has been considered "utterly frustrating in terms of the concepts it deploys [and the use of words and phrases that] can seem unnecessarily baroque" D. Smith (2013, p. 92).

in educational discourse, especially educational scholarship, place his scholarly endeavors in line with those of this study; efforts that guide readers through the literature review and to a broad and comprehensive understanding of the concepts and processes that underlie the problematic view of technology, Technological Determinism.

Research Problem and Its Importance

> In the modern world, the most dangerous form of determinism is the technological phenomenon. It is not a of getting rid of it, but, by an act of freedom, of transcending it. […] This […] is an appeal to the individual's sense of responsibility. The first step in the quest, the first act of freedom, is to become aware of the necessity. (Ellul & Merton, 1964, xxxiii)

Technological Determinism has been found to be prevalent in the *general* discourse that commonly takes place outside of education (Best, 2009; Burnett, Senker, & Walker, 2009; Carr-Chellman, 2006; Edgerton, 1995; Hofmann, 2006; Leonardi, 2008; Lievrouw, 2006; Marx, 2010; Selwyn, 2010; Wyatt, 2007; Yang, 2009). The problem is that, in addition to being prevalent in *general* discourse, Technological Determinism is now becoming commonplace or, 'normalized,' *in educational discourse* (Clegg, 2011; Garrison, 2009; Oostveen, 2007; Stiegler, 2003, 2014; Strobel & Tillberg-Webb, 2008; Wiesemes, 2009).

While scholars have found Technological Determinism to be ubiquitous in the discourse *outside* of education, many have aired concerns that it is now becoming commonplace *in education* (Clegg, 2011; Garrison, 2009; Oostveen, 2007; Stiegler, 2003, 2014; Strobel & Tillberg-Webb, 2008; Wiesemes, 2009). Surry, Stefurak, and

Kowch (2010) make the concerns that today's educators face clear with an explicit warning:

> This is the trap of Technological Determinism. University administrators, faculty, leaders, and students have to be aware of this potential trap, develop a plan for avoiding it, and continually seek feedback from all stakeholder groups to ensure technology has not become an autonomous force on their campus. (2010, p. 8)

For more than three decades technology scholars have borne witness to a strong current of Technological Determinism that has been permeating *educational* discourse until now becoming normalized, established as part of educational 'common sense,' and so deeply seated in contemporary educational thinking that it undergirds most every aspect of pedagogical practice (Bingham, 1996; Clegg, 2011; Lawson, 2013; Oliver, 2011; Strobel & Tillberg-Webb, 2008). During the 20th century, rapid advances in the production of electronic technologies resulted in a push-back from educators about technology use and an adverse reaction to technology research from scholars ultimately resulting in "the rise of Technological Determinism in academic scholarship" (Luppicini, 2010, p. 54).

Purpose of this Study

The purpose of this study is threefold:

- *To explore the meaning of two contrasting ideological perspectives about technology: Technological Determinism and the unified view of technology espoused by French philosopher, Bernard Stiegler,*
- *To discuss the long-held concerns that so many have about the problematic effects of Technological Determinism on educational policy and practice and how the embrace of Stiegler's view of technology serves as a remedy,*
- *To examine the presence of those characteristics foundational to Technological Determinism in educational discourse by analyzing the ideological views of technology expressed in the writings of today's most influential educational leaders.*

Research Questions

The current study addresses the following three research questions:

- *What is Technological Determinism and how does it compare/contrast to the unified view of technology espoused by French philosopher, Bernard Stiegler?*
- *What are the problematic effects of Technological Determinism on educational policy and how are they remedied with the embrace of Stiegler's ideological view of technology?*
- *How does Technological Determinism manifest in discourse and are those ideologies foundational to a determinist ideology of technology present in the writings of today's most influential educational leaders?*

Justification for the Research

Besides the longstanding efforts that countless scholars have been making to eliminate the presence of Technological Determinism in education, contemporary researchers are urging educational leaders to study the way educators express their views of technology (Frabetti, 2011; Gunn & Steel, 2012; Kirkwood & Price, 2013; Lea, 2013). These researchers are looking for literature "that calls for a productive and improved articulation between technology and pedagogy in […] education that considers established scholarly, theoretical, and conceptual foundations" (Jones & Bennett, 2014, pp. 1–2).

More specifically, researchers are calling for studies that examine the prevalence of Technological Determinism in educational discourse (Clegg, 2011; Garrison, 2009; Oostveen, 2007; Stiegler, 2003, 2014; Strobel & Tillberg-Webb, 2008; Wiesemes, 2009). This is due, in part, to a gap in existing research in the area. For, while there are many scholars who are convinced that technological deterministic assumptions are becoming ubiquitous in educational discourse (Blacker, 1994; Clegg, 2011; Garrison, 2009; Oostveen, 2007; Stiegler, 2003, 2014; Wiesemes, 2009), to date, there are no studies available to validate their claims.

In recent years, the call for research examining the views of technology in education have been amplified as educators are increasingly exposed to a rapidly growing amount of technical information that must be internalized and acted upon. Stiegler (Stiegler, 2011b) explains that, with the move from printed text to digital media, information that was once held within specialized technical fields has now become accessible electronically, throughout the world. This expanding access as digital text has

exposed educators to a technical knowledge that is typical of technology professionals but much different from their own and of which they have little experience or understanding. Stiegler warns of a "radical displacement of technical knowledge [has created a] crisis of trust" (Stiegler, 2011b, p. 28) that short-circuits technology adoption and hinders technological transformation.

Scope and Limitations of this Study

This study focuses its efforts on the most influential educational leadership scholars in 2018 based on the *2018 RHSU Edu-Scholar Public Influence Rankings*. Future studies should extend the analyses to a greater number of educational leadership scholars' writings there are 200 scholars ranked each year. In addition to this, a study of those citing these scholars' works will help to determine whether there is a perpetuation of characteristics foundational to Technological Determinism through research.

Definitions of Key Terms

The following is a list of key terms found throughout this study:

Adaptation and Adoption

Adaptation or adoption occur through the process of an individual first hearing about an innovation and then ultimately using it. The individual will either 'adapt' to the technology or 'adopt' it, depending upon a number of factors. According to Rogers (1983) the five steps in this process are 1) knowledge (awareness), 2) persuasion (interest), 3) decision (evaluation), 4)

implementation (trial) and; 5) confirmation (adaptation or adoption). Figure 1 created by Rogers, gives a detailed insight into the rate at which specific variables affect the adoption of new technologies. These processes are covered more extensively in the literature review where the causes and effects of both adaptation and adoption are explained in detail.

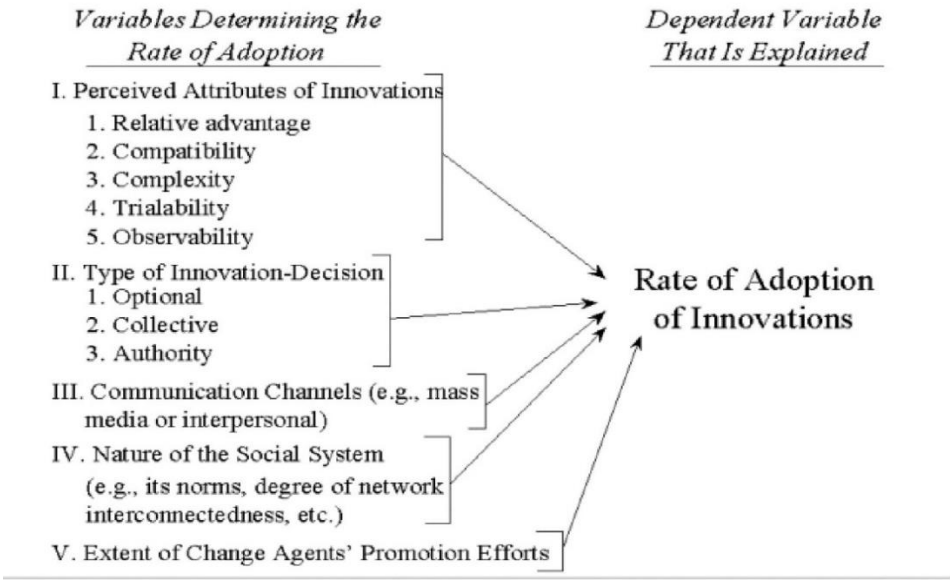

Figure 1 Variables Determining the Rate of Adoption of Innovations

Educational Technology

In their 2008 publication entitled*: Educational Technology: A Definition with Commentary*, the Association for Educational Communications and Technology (AECT) established the definition of educational technology as "the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources" (Januszewski & Molenda, 2008, p. 1). However, in the unified ideology of

Stiegler, any technology (techne) that is used to educate would be considered an 'educational' technology because the technology would be considered one with its use (phronesis) and purpose of its use (episteme).

Epiphylogenesis

Epiphylogenesis is the view of technology that the human evolutionary process is not merely biological, as we have come to understand from Darwin but that the human biological or genetic evolutionary process that ended 200,000 years ago has continued through the technological. Humankind came into existence not when it evolved biologically, but when the first human used tools. Until then, humanity was not yet human. What had begun *anthropogenically* or, as is commonly understood with Darwinian 'human' evolution, has continued *technogenically*; through a process known as *epiphylogenesis* (Lemmens, 2011).

Instrumentalism

Those holding to an instrumental view of technology see technology, whether it be a type of equipment, a tool, or machine, as a means to an end (Berger, 2011; Feenberg, 1991; Heidegger, 2009). Instrumentalists often see technologies as value neutral instruments, neither good nor bad.

Objectification

Objectification occurs when specific technologies are habitually represented by 'things'—by their most conspicuous artefactual embodiments: transportation

technology by automobiles, airplanes, and railroads; nuclear technology by reactors, power plants, and bombs; information technology by computers, mobile telephones, and television; and so on. By consigning technologies to the realm of things, this well-established iconography distracts attention from the human—socioeconomic and political—relations which largely determine who uses them and for what purposes. (Marx, 2010, p. 576)

Reification

Reification is what occurs when an individual "endow[s] a human activity with the characteristics of a thing or things. When these reified, inanimate objects, now separated from their human purpose, are invested with agency" (Marx, 2010, pp. 576–577). Herewith, technology goes beyond the troublesome condition as artifact. Having been identified as good or bad (even evil); technology drives humanity; becomes its savior, its demise.

Social Determinism

Social determinism sets aside the premise that technology has autonomy and agency. The social determinist assumes that technologies are developed and evolve through social processes; technology is not considered ethically neutral with social perspectives guiding technological change (Kanuka, 2008; Lievrouw, 2006; Strobel & Tillberg-Webb, 2009).

Technological Autonomy

Closely associated with reification is another feature of Technological Determinism whereby technology is presented […] as an independent, self-controlling, self-determining, self-generating, self-propelling, self-perpetuating and self-expanding force. (Chandler, 2014)

Technological Determinism

In the 2011 interview with Bernard Stiegler discussed elsewhere in this study, philosophy of technology scholar Pieter Lemmens explained that "in the philosophy of technology, one distinguishes roughly between two opposing views about the relationship between technology and society: on the one hand, Technological Determinism […] and on the other hand social or cultural determinism" (Lemmens, p. 35). Technological Determinism is a view of technology that holds that 'technology' is the driving force in human life and determines the way in which society and human culture are shaped. The opposing view, social or cultural determinism, holds that humanity is the driving force that changes technology; that society and/or culture determines how technologies change.

Hard Technological Determinism. Technological Determinism is considered 'hard' when, in addition to autonomy, 'agency' is attributed to technology (M. Smith & Marx, 1994) and technology becomes a dominant cause of social change, independent of other factors (Strobel & Tillberg-Webb, 2008).

Soft Technological Determinism. Technological Determinism is considered 'soft' when technology influences social change but is merely one factor among others affecting social change that occur as part of a complex interaction of social, economic, political, and cultural factors (M. Smith & Marx, 1994; Strobel & Tillberg-Webb, 2008).

Technological Utopianism and Dystopianism

While the contrast between Technological Determinism and Social Determinism is concerned with what causes change, the contrast between Utopianism and Dystopianism is concerned with valuing the results of technological change. Technological Utopianism embraces the promise of technology and is an optimistic position that presents technological innovation as something for the better. Technological Dystopianism (or Luddism) is a pessimistic position generally not open to technological innovation, and resists technological change (Webster, 2013).

CHAPTER II

REVIEW OF RELEVANT RESEARCH AND LITERATURE

> *The challenge is not to scholars and university professors [alone], but to all of us. […] Each of us, in his own life, must seek ways of resisting and transcending technological determinants.* (Ellul & Merton, 1964, xxxii)

The *Review of Relevant Research and Literature* begins with a detailed discussion of the 'Cycle of Dis-Integration' that takes place when Technological Determinism is present. The *Review* details each iteration in the process of embracing a technology and the ultimate effect that one's views and ideologies about technology have on its use. The *Review* then discusses the core elements of Bernard Stiegler's unified view of technology, beginning with his first and most significant work, his three part opus, *Technics and Time 1: The Fault of Epimetheus* (1998). Here, Stiegler explains that the problematic theory of Technological Determinism came to be as the result of a philosophical error that took place in ancient Greek thinking when technology was first considered separate from humanity. Stiegler maintains that it is in this significant rethinking and misunderstanding of technology that humanity has forgotten its true "technological condition" (2011, p. 36), and that it is as a result of this misunderstanding that humanity struggles to effectively discuss and embrace today's unprecedented increases in digitalized technical information and ubiquitous computer-based innovations. The *Review* closes with an examination of Stiegler's efforts to confront the broader societal implication that is manifested from a deterministic ideology of technology as proletarianism and capitalism.

The Effects of Technological Determinism

The following examines the process by which Technological Determinism is established and its effects manifested. The process begins with the 'Displacement of Technical Knowledge' discussed above where, through the scholarship of educational leaders, technical ideas are introduced to educators and the world in an unprecedentedly precipitous manner through digital media. The lack of an established ideology of this information, causes 'Ambiguity' when articulating the technology's expected use. This lack of clarity, in turn, results in 'Reification and Agency,' wherein technologies are conceived of as independent entities separate from humanity that exhibit autonomy and self-governance.

Viewing technologies as autonomous, self-governing entities results in 'Adaptation and Poor Transformation' in that it causes those embracing technologies to adapt to rather than adopt them. This, then, results in the creation and application of policies and practices that fit the strengths and weaknesses of the technologies, as opposed to the needs of those engaging with them and leads to a lack of success using technologies where the purpose of a technology's use does not fulfill its expectations. Ultimately, the *Cycle of Dis-integration* leads to a lack of technological transformation which is the lifeblood of human existence. The impact of poor technological transformation is discussed in greater detail below.

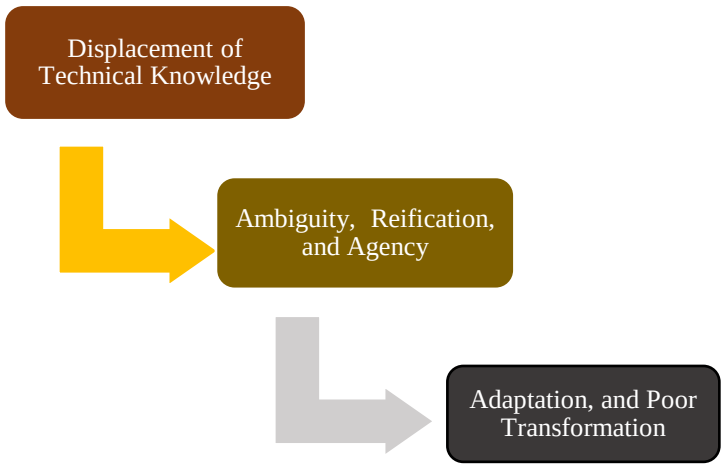

Figure 2: The Cycle of Dis-Integration

The Displacement of Technical Knowledge

With the introduction of computer networks and the internet, Stiegler came to realize the impact that new digital communication has on the way technology is understood and used. He writes of this realization in his 2011 article entitled, *Distrust and the Pharmacology of Transformational Technologies*, where he points to the uncontrolled release of information about technology as the beginning of many of the struggles taking place in education and society, especially with today's computer-based technologies.

> With digitalization, this knowledge, which had been kept in the hands of the professional classes, and thereby controlled by the economic world, migrates toward the largest audiences. (2011b, p. 28)

In his, *The Decadence of Industrial Democracies* (2011a), Stiegler describes humanity's exposure to these technical ideologies through the *Myth of Pandora*. In it, Stiegler points out that along with the evils of humanity, *pain*, *illness*, and *death*

described by Hesiod (Verdenius, 1985) to be in her possession, Pandora also carried '*elpis*' or, *hope* and *expectation*. Stiegler emphasizes that, in the story, the hope that Pandora offered Epimetheus quickly turned to despair. Stiegler equates the opening of Pandora's Box to the release of technical knowledge that occurred with the introduction of computers and the internet.

The transition from printed text to digital media has straddled the millennium, having its greatest growth in the decade before 2000 and its greatest impact in the decade just after. As colleges and universities gained access to digitalized texts, now available over rapidly increasing high-speed access to a newly embraced internet, it became abundantly clear that, to those without a technology background, this expanded access to technical knowledge would forever change higher education. Those without a technical background were met with new technical knowledge. Scholars who specialized in fields other than the technical, found that 'technology' had different, constantly changing meanings throughout the Academy. Thus, the concept has lacked clarity.

Stiegler argues in *Distrust and the Pharmacology of Transformational Technologies* that those that have been exposed to today's digitalized technical information, must make sense of its unique and complex collection of technical terminology, jargon, and concepts that are too often misinterpreted and poorly communicated leading to real-life practical issues with actual technologies (2011b). Stiegler expands on his thinking a year later in another of his articles entitled, *Relational Ecology and the Digital Pharmakon* (2012), where he explains how today's internet-based information has been equated by the public with education research.

Stiegler fears that individuals and society are interpreting and making use of technical knowledge without the ability to consider the nature of technology itself. In truth, when looking at his works as a whole, one can see that at the heart of all Stiegler's efforts lies this concern; that *a misunderstood concept of technology is problematic to its use, hinders technology adoption, and short-circuits technological transformation*. Stiegler goes on to point out he is in no way the first to air concern. In fact, over two centuries earlier Immanuel Kant had predicted how problematic it would be should the overseers responsible for technical knowledge be found wanting.

> Kant, in discussing the 'Republic of Letters', had already envisaged this issue in *The Conflict of the Faculties* (1979) when he emphasized the specific question that the knowledgeable communities and the amateurs of his epoch posed to the 'corporate experts' (the professors). (Stiegler, 2012, p. 17)

It is possible to understand Stiegler's intense emphasis on the 'displacement of technical knowledge' by looking back to the experiences he had while first developing his philosophical views as a prisoner. The previously mentioned routine (See the '*Brief History of Bernard Stiegler*' in *Chapter I*) that Stiegler established during his five-year incarceration included a daily reading of the works of Stéphane Mallarmé. Mallarmé's embrace of Symbolism was foundational to Stiegler's ideologies and part of a literary movement that brought together the ideas of a great diversity of scholars during the late nineteenth and early twentieth centuries in France and Belgium, eventually to spread throughout the Western world (Lloyd, 2005).

However, as significant as Mallarmé's expression of the symbolic may have been to the establishment of Stiegler's views, he has been just as important to him for his

actions as an international socialite and academic. Mallarmé was born in 1842, Paris where he lived most of his life, except for a period he spent in London studying to teach the English language. He was a poet, whose works had had a substantial effect on the aesthetic theory of his time. Mallarmé's celebrity, however, had come from his Tuesday gatherings that brought noteworthy individuals and diverse minds together to share their ideologies in a much less traditional, formal, and controlled setting than was their norm (2005).

For those who would take part in the Tuesday meetings, there would be an uncommon freedom of expression when meeting outside of their perspective environments in that they had freed themselves for a moment from their roles as those responsible for the oversight of technical expression. The academics, scholars, and professionals who would gather at Mallarmé's Tuesday meetings, away from the classrooms, libraries, and offices that were their custom, could allow themselves to share, unfettered, the information they had garnered while working within their perspective areas of expertise.

Mallarmé's weekly gatherings provided a valuable service, opening exchanges of ideas that were the basis for cultural periods of transformation like those of the *Renaissance* and *Enlightenment*. Stiegler would come to see today's digitalization of information and its accessibility through global connectivity in a similar light; that is, with one great exception. Those taking part in the Mallarmé gatherings were typically well-educated and well-off, properly equipped to understand and discuss diverse types of knowledge, including the technical.

Those exposed to today's technical information, on the other hand, frequently find themselves ill-equipped to deal with their exposure to a rapidly growing influx of technical concepts and jargon. They often lack the requisite educational and/or contextual backgrounds and foundations of ideologies from which to draw to interpret today's technical knowledge and effectively use today's new technologies. That is, prior to the advent of digitalization and global communication capabilities, technologists had guardedly kept information about new technologies to themselves, realizing their responsibility as knowledge keepers to educate others about them; however, after digitalization this oversight became mute, as anyone with access to the internet could access that same information with the push of a button or click of a mouse.

Ambiguity, Reification, and Agency

Leo Marx, in his aptly titled 2010 essay, *Technology: The Emergence of a Hazardous Concept* addresses his concerns and those of other technologists when examining the changing, or 'emerging,' concept of technology deeming it 'hazardous.' Marx (2010) shared the concerns of Amiel & Reeves about the effect that a poorly understood technology has on education and society. The author explained that its hazardous nature is a consequence of decades of inconsistent thinking about the meaning of technology, and that the resultant ambiguity has made technology vulnerable to reification.

Marx described reification as an objectifying of technology, a stripping-away of a fundamental aspect of its nature, namely technology's relationship to humanity. He went on to explain that when one thinks of technology as merely a 'thing,' it takes on its most

obvious embodiment: *transportation* technology becomes merely cars, planes, and railroads; *nuclear* technology, reactors, and power plants; and *educational* technology, computers, eBooks, and projectors.

Relegating technology to the realm of things neglects the human aspects of its use. That is, an objectified definition of technology ignores context. It only answers the question of *how* something is to be done (i.e. using a car, a power plant, or a projector). It neglects to answer the questions, about *what* is to be done (i.e. the transporting of people, furnishing of electric power, or communicating with students), and *why* it is to be done (i.e. to reach a specific destination at a specific time, to provide power to a specific region, or to teach a specific group of students a specific subject).

For educators, a reified concept of technology can have a lasting, negative effect on policy and practice. When conceptualizing technology as merely a tool, for example, administrators, faculty, and even students might expect increases in efficiency and effectiveness based solely on the purchase of a computer or hosting of a website; or, might introduce new technologies without consideration of planning, training, maintenance, and support. On a broader scale, a reified technology dehumanizes heated issues like the digital divide, reducing them to mere line items in budgets and assessments of performance.

Even more disconcerting than reification, however, is what too often occurs when technology acquires *agency*. Here, technology takes on human or even super-human qualities. It becomes good or bad (even evil). Technology is empowered. It drives us; becomes our savior, our demise. For educators, an agency-laden technology too often stands between policy decisions and curricular/pedagogical choices by allowing

administrators and faculty to take, often unfounded, ideological positions simply because they see technology as the ultimate solution or cause of a problem.

Adaptation and Poor Transformation

Whether the embrace of a technology ends up being an intended benefit or an unintended harm, depends upon whether its embrace takes place through *adoption* or *adaptation*; whether the established thinking and practices of an individual or group will be disrupted and changed to fit the characteristics and limitations of a new technology, or whether the established ways will advance and transform along with a new technology.

With technological *adoption*, the collective capabilities of the individual and the technology come together to become a new *technical* entity, where the whole becomes greater than the sum of its parts. Here the human and technology become one, where the technology becomes an extension to the human as a *technical prosthetic*. According to Stiegler, with adoption both the object and the individual, *come together*, to become a 'new *technical* being', a "new form of life" (Lemmens, 2011, p. 35). Unlike adoption, with the process of technological *adaptation*, the individual or group change their thinking and practices to meet what they see as the capabilities or limitations of the technology. Stiegler argues that whether an individual or organization embraces a newly introduced technology through adoption or adaptation depends upon how they embrace that technology conceptually; and whether that new technology is adopted or adapted to determines the quality of its transformation.

For Stiegler, the human life is a technical life and, as discussed above, living technically involves living through technical expression or, *exteriorization*. If a human

being is to express him or herself in a uniquely human/technical way, it follows that that expression must be with another humankind who can take in or, *interiorize* that expression. To put it in another way, human life truly takes place when an individual interacts socially, through the technical. Thus, for Stiegler, there are three parts to the human/technical puzzle, the *individual*, the *technical*, and the *social*. Stiegler explains that humanity's epiphylogenetic evolution occurs in three distinct ways, *psychically*, *technically*, and *socially*. To illustrate, he looks to the interconnectedness of the ant, the anthill, and the ant colony (2011). Stiegler surmises that there is no way to understand one without the others. Like the human, the ant as a social animal is only understandable when considered in relation to its physical surroundings and the others of its kind.

Borrowing from the philosophical ideas of French philosopher Gilbert Simondon, Stiegler refers to the processes by which humanity continues its technological evolution, the ongoing aspect of the epiphylogenetic process. Taking from Simondon, Stiegler conceives of human life as a process of becoming. The human being begins as a *preindividual*, without distinction from others; then becomes an *individual*, distinguishing themselves from others by exteriorizing themselves through their interaction with technologies; and finally, becomes a *transindividual* by engaging with others or, interiorizing the exteriorizations of others. "For Simondon, technics mediate between the *preindividual* and the *transindividual*" (Stiegler, 2011b, p. 29).

When preindividuals exteriorize themselves through the *adoption* of technologies or, *technical prosthetics*, they become human individuals. These human individuals can then interact with other individuals by exteriorizing *and* interiorizing themselves through adopted technologies to become transindividuals. Thus, according to Stiegler, individuals

only become *fully human* when they interact with others; and that a *fully human* interaction only comes as part of an engaging with something outside of themselves.

The Broader Societal Implications

Most of Stiegler's recent academic life has been dedicated to considering the effects of Technological Determinism in its broadest, societal sense. Stiegler advocates for educational scholars to understand their significant role in guiding others to a reconnecting to humanity's *original technological condition* through their writings as mnemotechnics. Stiegler's emphasis on the ideological perspective of Technological Determinism has led him to fight against its manifestation in society as Capitalism and Proletarianism. In doing this, he has expanded his role from merely researcher, scholar, and Subject Matter Expert to an activist voicing anti-Capitalist rhetoric and for the de-proletarianization of the contemporary global society.

As written above, "philosophy, according to Stiegler, should engage itself in the global struggle for the mind against a capitalist system" (Lemmens & Stiegler, 2011, p. 34). To explore the effect of Stiegler's views on the broader society, one might begin by looking more closely to the processes of adaptation and adoption in society as they relate to the innerworkings of, for example, a business: a company, a wage earner, and a new piece of equipment.

Should a company *adopt* a new piece of equipment, the focus would be placed on the worker. It would be focused on the worker accomplishing an objective *through the use of the new technology*. Looked at it in this way, there would be a focus on the human aspects of the technology use: Implementation, training, maintenance, support that is

guided by the capabilities and limitations of the *user*. The underlying thought would be of the user having originally been able to accomplish their objective *through the use* of the older technologies; and now, the *user* being able to expand their capabilities *through the use of* the new technology. With adoption, we see the embrace of technologies as '*prostheses*,' allowing the worker and the technology to be brought together to create a '*new being*' and for the range of possible improvements in efficiency and effectiveness to be based on the strengths or weakness of the *user and the technology together as one*, as opposed to the technology alone.

On the other hand, should the company *adapt* to a new piece of equipment, the focus would be placed on the technology. Here, the company would be forced to change its policies and the workers their practices to meet the capabilities and limitations *of the new technology*. Policies and practices *would have to be limited*, boiled down to allow for different workers to be 'plugged in' when necessary to make sure that the equipment is operating. There would be a focus on technology use: Implementation, training, maintenance that would be guided by the capabilities and limitations of the *technology*. Using an example from education, with adaptation, training and support would be given from technologists, rather than educators with a consideration of the educator and technology use.

With adaptation, one looks to the *technology* for possible improvements in efficiency and effectiveness based on the strengths or weakness of the *technology* rather than the user. With adaptation an educational leader may be moved to introduce to another school a technology that is improving the grades at one school. Instead of focusing on the ways in which *the school* with improved grades and *its educators* have

made improvements *through their use of* the new technology, they may assume that simply giving the new technology to a school will have the same results.

Stiegler, along with Simondon and Marx, argue that adaptation manifests as the process of *proletarianization*. He writes of proletarianization as "the process through which an individual or collective knowledge, being formalized through a technique, a machine, or an apparatus, can escape the individual" (Lemmens & Stiegler, 2011, p. 37). Or, the process through which an individual or 'human,' stops being human. This is because the individual's knowledge "has been inscribed in the machine" (Dillet, 2017, p. 84). That is, the individual is exteriorizing their knowledge to the technology and, because technologies cannot interiorize or, comprehend knowledge, the knowledge is lost. "What is proletarianization? It is first of all the exteriorization of knowledge in technics" (Lemmens & Stiegler, 2011, p. 37).

In the same interview with Lemmens, Stiegler explains that the idea of proletarianization is a concept born of his work's 'Marxist strand' that is expressed in his social and political critique and his development of his organization, *Ars Industrialis*. Stiegler explains that to alleviate

> capitalism's proletarianizing tendency to turn all things into a hypercalculable environment in which singularities and desire disappear. Stiegler's philosophy thus clearly inherits the Marxist framework and axioms, while also displacing the notion of the proletariat into a larger notion: proletarianization. (Dillet, 2017, pp. 80–81)

Proletarianization is an ever-changing process for humanity for, to truly live, the human must continuously evolve by exteriorizing and interiorizing through technologies as

prostheses which is especially true when the exteriorizing is done through writing, print, and digital media. Hence, there must be an intense focus on ending proletarianization through the process of de-proletarianization, which is a reoccurring emphasis expressed throughout the founding documents of Stiegler's organization or, the *Ars Industrialis Manifesto*:

> De-proletarianization which is a re-conquering of responsibility, must be placed at the summit of political and economic goals to be promoted and realized in the years to come. (Ars Industrialis, 2010, § 6)

Stiegler's Unified View of Technology

> Now your question was Technological Determinism or not. Well, there is no Technological Determinism. What there is a technological condition. (Lemmens, 2011, p. 36)

The quotation above represents Stiegler's response to the very first question asked by interviewer Pieter Lemmens concerning Stiegler's ideas about technology and how they reflect on what is understood to be the most commonly held view of technology, *Technological Determinism*. This significant interview is one of a growing number of opening salvos as American educators and philosophers of technology try to make sense of Stiegler's views considering their own and it serves here as an introduction to his most important, foundational concepts.

When asked in that interview to characterize his views of technology as they relate to Technological Determinism, Stiegler declined. Instead, he set about to show how the very concepts that lie at the heart of these views, *technological autonomy* and *agency*

are, in his words, “completely artificial” (2011, p. 35). Stiegler explains that these views are based on several widely held misconceptions about the origins and nature of technology, and the relationship between the human and the technical.

Stiegler’s response above speaks to his disbelief at the very idea of Technological Determinism. There can be no distinction made between the human and the technical because *the human and the technical are one*. Stiegler explains that the technical is a *condition* of being human, just as one might speak of an individual’s medical condition. Being technical is not something humankind *has* or *does*, technical is something humankind *is*. For Stiegler, to be human *is* to be technical.

For decades, concerns about the effects of Technological Determinism have been growing in academic circles, especially those in America where the theory is now considered by many, the most widely held view of technology in education (Clegg, 2011; Oostveen, 2007; Wiesemes, 2009). The theory of Technological Determinism that views technology as an autonomous force, driving the development of the individual and society, has become a truly American problem. The continental ideology of Technological Determinism that has most often been associated with Jacques Ellul and Karl Marx, was first established in America by sociologist and economist Thorstein Veblen and his contemporary, historian Charles A. Beard.

> [The deterministic perspective of technology] did not catch on in America until around 1900, when a few influential writers, notably Thorstein Veblen and Charles Beard, responding to German usage in the social sciences, accorded technology a pivotal role in shaping modern industrial society. (Marx, 2010, p. 562)

Since then, American scholars like Blacker, Clegg, Leo Marx, and others have continued the discussion about Technological Determinism. More recently, increases in the number of English translations of Stiegler's works are now lending a new re-introduction of the 'continental' (i.e., European) voice to the discussion.

The philosophy of technology's move from Europe to America is described by Dutch philosopher Hans Achterhuis in his edited work entitled, *American Philosophy of Technology: The Empirical Turn* (2001). In it, Achterhuis argues that the philosophical views of the twentieth century that had flourished primarily in Europe,

> have now been superseded by more empirical approaches whose practitioners reside in the United States, [and that] the center of gravity of the philosophy of technology has moved from Europe to America. (Hickman, 2003, p. 306)

The American philosophers featured in Achterhuis' book include Albert Borgmann, Hubert Dreyfus, Andrew Feenberg, Donna Haraway, Don Ihde, and Langdon Winner. The views of these scholars represent a movement coined by Achterhuis as the *empirical turn* in the philosophy of technology.

One of these authors, Ihde, describes the move from the classical, continental thinking about technology to an Americanized view, as a stepping away from the generalized, transcendental ideologies of what is considered technical and toward a closer examination of the materiality of technologies as part of the broader human culture (Preester, 2010). It was a change that focused on the distinction between what was understood to be *human* and what was understood to be *technical*.

Some of those represented in Achterhuis' collection have gone as far as to celebrate openly the move from the classical, continental stance, proclaiming that only

the Americanized thinking of the 'empirical' philosophers hold the truth about the meaning of technology. Feenberg makes this clear when he declares in a recent presentation that "in the past 30 years we have abandoned all Heideggerian positivist notions and faced the real world of technology" (2010, 2:56-3:04).

While Stiegler's views of technology are built in many ways on those of his European predecessors, they are unique in that they reinterpret them by considering more closely the original, ancient Greek ideology of the human/technical relationship. The translation of Stiegler's ideas from French to English are bringing a fresh, innovative reintroduction of the classical, European views of technology to America, representing what is coined here as the '*Epiphylogenetic Turn*,' based on Stiegler's unique theory of the human/technical relationship that he calls *epiphylogenesis*.

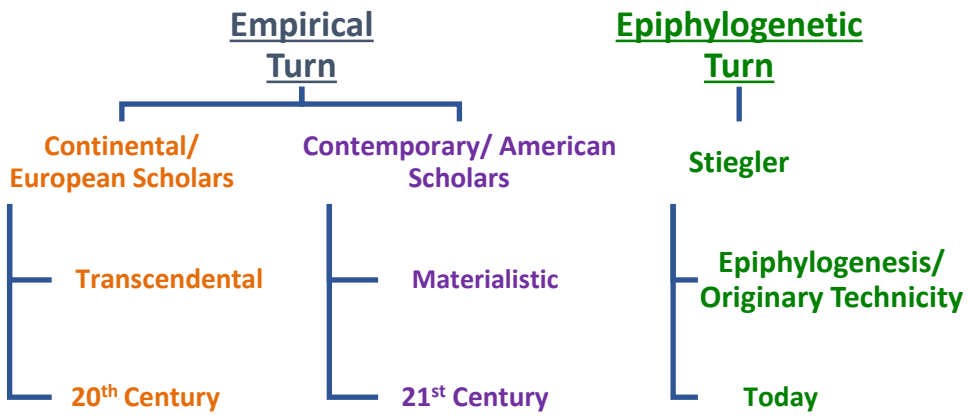

Figure 3: The Changing Relationship Between Humanity and Technology

Anyone observing today's research in the field of the philosophy of technology will attest to the mounting, worldwide interest in Stiegler's works. However, while there

is already a wide collection of scholarship speaking to how his ideas relate to those of *continental* philosophers like Derrida, Heidegger, Foucault, and others; *there remains a significant gap in the scholarship* discussing how Stiegler's ideas relate to those of the *American* philosophers of the 'empirical turn' and on the topic of *Technological Determinism*.

Many, for example, have already written about the ideas that Stiegler has gleaned from the writings of his mentor, Derrida, and the influence he has had on Stiegler's ideology of the *pharmacological* nature of technology (Bluemink, 2015; Lemmens, 2011; D. Smith, 2013; Strutt, 2015). Others have written about how Stiegler's ideas of the *prosthetic* nature of technology relate to Heidegger's view that technology recedes from view when used (Barison et al., 2004; Bradley & Armand, 2006; Cusset, 2008; Roberts, 2012). And still more have written about how the ideas of Foucault are prominently displayed in one of Stiegler's more important, recent works, *Taking Care of Youth and Generations* (Galloway, 2011; Iveson & Stiegler, 2012; James, 2012; Stiegler, 2010).

Any comparisons that have been made between Stiegler's views of technology and those of American scholars, like how his and Ihde's agree that Western philosophy have neglected to focus enough attention and effort on the meaning of technology, and of their views when it comes to the origins of technological thought (Preester, 2010), have neglected to look deeply at how their collective ideas differ from one another.

In a recent review of what has been called the first serious collection of essays on the writings of Stiegler, edited by scholars Christina Howells and Dr. Gerald Moore entitled, *Stiegler and Technics* (2013), philosopher Dominic Smith speaks to the

significant place that the study of Stiegler's ideas takes in relationship to today's American-dominated, *post-empirical turn*, field of the philosophy of technology.

> This is an excitingly inchoate field at present, incorporating aspects of everything from analytic philosophy, to the Dutch 'empirical' approach centered on the University of Twente, to social constructivism. […] Many within this field are currently primed to write [Stiegler off] as a thinker in the vein of 'classical' philosophers of technology like Ellul, Jonas, and Heidegger, for example; through the intervention of collections like *Stiegler and Technics,* however, we might just learn to read his work with the degree of selective attentiveness appropriate to it. Should this occur, Stiegler may emerge as a poetic and aporetic philosopher of technology *par excellence,* at the threshold of a 'continental turn' in philosophical reflections on technology. (2013, p. 96)

It has only been in the past five or so years, with the increased translation of Stiegler's writings into English[2] and the amplified recognition of those works in the 'continental' world that his views have come up against those of the American. It makes profound sense, therefore, that since so much has already being written about Stiegler's views as they relate to his 'continental' counterparts, this study focus on the impact that his ideas

---

[2] I have attached as an addendum to this study a comprehensive collection of Stiegler's works that have been translated into English (2012). These titles were brought together by a few of the growing number of American scholars who have focused their attention on Stiegler's works, namely, Patrick Crogan, Ben Robertson, and Daniel Ross.

have been having on contemporary American thinking and especially the concerns they bring to light concerning Technological Determinism. It is important to note here the impact that the distinction between languages and their translations may play in the way scholars come to understand Stiegler's ideas in light of the disparate continental, post-empirical turn, or Stiegler's epiphylogenetic ideologies of the relationship between humanity and technology.

Humanity's Bio-Technical Nature

For Stiegler, technology is a process, "an evolutionary process" (Lemmens, 2011, p. 35). He argues that human evolution is not merely biological, as we have come to understand from Darwin but that the human *biological* or *genetic* evolutionary process that ended some 200,000 years or more ago has continued through the *technological*. Humankind came into existence not when it evolved *biologically*, but when the first human used tools. Until then, humanity was not yet human. What had begun *anthropogenically* has continued *technogenically*; through a process Stiegler has termed, *epiphylogenesis*.

Stiegler describes the original pre-human/pre-technological condition by way of a retelling of the Greek myth of Epimetheus (1998). Most know of the story of his brother, Prometheus, the Titan who stole fire from Mount Olympus to bestow it on humankind only after to suffer the wrath of Zeus by having his liver eaten daily by a giant eagle. However, Stiegler focuses on the lesser-known story of his brother and of what happened prior to Prometheus' self-sacrificing act. Through the story of Prometheus and Epimetheus that can be found in the writings of Hesiod, Aeschylus, and Plato; Stiegler

explains that humankind is technical.

When the gods first inhabited the earth with mortal creatures, the last action that was taken to bring them to life was to give each being the qualities and capabilities that would make them whole. Each being was given its unique abilities, the lion was provided strength and fierceness, the antelope speed and agility, and the fox cunning to make them complete. Thus, the gods called on the Titan brothers Prometheus and Epimetheus to mete out to each their distinctive characteristics. However, before they began, Epimetheus approached his brother and begged him that he might make the provisions on his own. After some coaxing, Prometheus agreed, and Epimetheus set about to distribute the characteristics that would complete each of Earth's inhabitants. The problem was that when Epimetheus reached his final inhabitant, the incomplete human, he found that there were no qualities nor capabilities left to give. All the characteristics that made beings what they are were gone. Stiegler explains that the human was left the only one without; the forgotten one; the incomplete; the one absent of qualities and capabilities; the humankind was not yet, *human*.

Having heard of his brother's mistake and that humankind had been left "naked, unshod, unbedded, and unarmed" (1998, pp. 187–188), Prometheus decided that he would make up for his brother's lack of foresight[3] by giving humankind other qualities,

---

[3] Hesiod explains that Prometheus' name stands for 'forethought' and Epimetheus', 'afterthought' (2009, p. 67). This will become significant when he is discussed in a following chapter concerning Pandora's Box (2009, pp. 94–104). For, it is in

qualities of the gods that would eventually prove much superior to any of those that were given to the other beings. Prometheus would provide to humanity '*technology'* in the form of the god Hephaestus' fire and with it, '*technical'* capabilities in the form of skill and artistry from the goddess Athena.

> Prometheus [...] stole the mechanical arts of Hephaestus and Athena, and fire with them (they could neither have been acquired nor used without fire) and gave them to man. Thus, man had the wisdom to support life. (Plato, 2009, p. 39)

Only after they were brought together could the human form molded by the gods and the technological capabilities given by Prometheus become human. That, humanity's newly established technological condition made humanity, *human*.

While Stiegler readily acknowledges the efforts of those who have influenced his views, he is just as willing to point out when those views differ. For example, when speaking to how the epiphylogenetic view of technology relates to those of the pre-empirical turn, continental views, Stiegler proclaims without hesitation that, "we shall thereby call in question Heidegger's claim that 'the essence of technics is nothing technical'" (1998, p. 18). This is because for Stiegler, 'the essence of technics is *everything* technical.' That is, humanity 'evolves,' and 'exteriorizes' (i.e., interacts with

---

Epimetheus' forgetfulness or lack of foresight that Stiegler explains both humanity being left incomplete at its creation and to explain the displacement of digitalized technical knowledge that has been the catalyst for today's wide-spread embrace of Technological Determinism.

the world) *only through the use* of technologies. For Stiegler, *everything* about being human is technical.

In fact, Stiegler's introduction to *Technics and Time 1: The Fault of Epimetheus* is dedicated to explaining how his views represent a new way of approaching the question of humanity's relationship with technology, one that, while *fed* on the continental thinking of Heidegger and others of Europe, are distinct in that they were *born* of ancient Greek thought. Stiegler makes very clear the foundational differences between his views and the continental when he prefaces his opus work by explaining that "the following reading rests on a confrontation between Heideggerian existential analytic and the myths of Prometheus and Epimetheus" (Stiegler, pp. 16–18). Stiegler's views of technology, while having their roots in the Continental, French, and German philosophies, differ from them. And, in this difference, they offer a new way to approach contemporary American ideologies about technology.

How then does the new idea of humanity's technological condition that is both founded upon and differs so from the continental views, reflect on the American discussion of Technological Determinism? The answer begins with an awareness of how important it is that these contemporaries view individual technologies as discrete objects, separate from humanity, and how this ideology is a precursor to deterministic thinking about technology. For, it is in the separation in which technology is viewed as an independent object, that technological autonomy and agency occur, and Technological Determinism is made possible.

Without its technological qualities and abilities, human beings are incomplete. Stiegler argues that they are, in fact, less than human. The savage child, Stiegler

illustrates metaphorically, that has not learned to walk and communicate is not yet human. It is pre-technologically evolved. “Such a child is not really human. It is a potentiality of humanity, but it is not human. It is a very strange being between animality and humanity” (Lemmens, 2011, p. 35).

> What differentiates humans from other animals is a process of technical exteriorization. […] Human evolution is based on […] an entirely new process of evolutionary differentiation operating outside of the biological organism, i.e., not of genetic differentiation, but differentiation of technical prostheses. (Lemmens, 2014, p. 77)

Stiegler maintains that it is by expressing or, *exteriorizing* themselves through technologies or, technological prostheses that humankind fulfills its potential. Separated from technology they are only potentially ‘human,’ just as an object separated from human interaction is only potentially ‘technical.’ In fact, the ‘things’ that makeup the world are *all* potential technologies, but they do not take on a technological ‘condition’ until they are brought together with humankind. It is only in the writing of a letter or giving of a speech that a pencil or language becomes technical. For Stiegler, there exist three types of being: *organic*; *inorganic*; and *inorganic organized beings or, technologies*. Things are not limited to only organic or inorganic; they can also be ‘technical.’

> There does indeed exist a third genre of ‘being’: ‘inorganic organized beings,’ or technical objects. These nonorganic organizations of matter have their own dynamic when compared with that of either physical or biological beings, a dynamic, moreover, that cannot be reduced to the “aggregate” or “product” of

> these beings. […] As a "process of exteriorization," technics is the pursuit of life by means other than life. (Stiegler, 1998, p. 17)

Stiegler explains that no distinction can be made between humanity and technology because to be a human being means to be one with the organized inorganic material or, technologies they use. In fact, for Stiegler, when the human and the technical are brought together, they become a new entity, a new *being*. "What is technics, technology, or technicity? It is a new form of life, a very specific form of life" (Lemmens, 2011, p. 35).

While Stiegler's ideas are just now being fully introduced to those in America, they can be compared to some of its contemporary philosopher's views of technology. For example, in his well-known article, *Philosophy of Technology and Education: An Invitation to Inquiry* (1994), American philosopher of education and technology, David Blacker, discusses how the views of two of the world's most prominent technology thinkers, 'continental' German philosopher Martin Heidegger and American philosopher John Dewey, are similar to Stiegler's.

> [Blacker writes that] one of the most peculiar properties of technology, both thinkers hold, is that insofar as a tool really functions *as a tool,* it, in a manner of speaking, hides itself in its function, or as Heidegger puts it, it "withdraws" from proximal view. (Blacker, 1994, p. 5)

Blacker explains that to Dewey, a tool is an object that when used, is embodied by a natural bond that makes the idea of it and its actual use something new, a concept not unlike Stiegler's idea of the human/technical connection as 'a new form of life.'

Heidegger's now well-known illustration of the process of hammering is even more on point. Blacker tells Heidegger's story about the building of his daughter's

dollhouse that he uses to describe his idea of the relationship between the human and the technical. Through the tale, Blacker explains that while it is common, according to Heidegger, to say that he is '*hammering*' nails when building, in all actuality what is taking place is that he is *'nailing*' boards together. He may very well be using a hammer but could just as easily be using a rock or a baseball bat for that matter. The point is that when he drives a nail into the boards to build his daughter's gift, the nail becomes the focus of his attention and, in Heidegger's words, "the materiality of the hammer recedes from view" (1994, p. 5). The hammer as technology becomes an extension of the human and the human and technology become indistinguishable.

Heidegger's view of technology is more like Stiegler's idea of technology as prosthesis than is Dewey's. That is, except for one incredibly significant factor, for Stiegler, there is no distinguishing at all between humanity and technology. Whereas, both Heidegger's and Dewey's views differ from Stiegler's in the same profound way that sets Stiegler's views apart from those held in America today. For, even in the most unified ideology of humanity and technology expressed by Dewey and Heidegger, there remains the idea of technology as an individual object.

Over the past three decades, in the efforts of American philosophers of technology to establish an orthodox definition of technology, one thing has been consistent, their continued expression of a clear distinction between the human and the technical, something that is not as clear in 'continental' thinking, and that is absent in Stiegler's. This was acknowledged nearly 20 years ago by American postmodern cultural scholar and philosopher of technology Paul Michael Privateer in his article, *Academic Technology and the Future of Higher Education: Strategic Paths Taken and Not Taken*

(1999).

> Here, Privateer airs concerns about the prevalence of what he refers to as an entrenched "replicant paradigm" [that] prevents many academic strategists from recognizing the potential revolutionary power of academic technologies because of a conventional sense of their cost-benefit ratios. This sense of value is problematic for several reasons. For instance, instructional technologies are not like boxes of pencils with simple price tags, simple functions, and simple outcomes. In fact, they are not discreet objects at all […], but rather they are intricately related and highly integrated learning systems. (Privateer, 1999, p. 65)

Yet, even with his acknowledgment of the current limitations of American thinking about technology and the ideology that technologies are not merely individual objects, but 'highly integrated systems,' Privateer still does not go as far as to see humanity and technology as one. His 'systems' still differ greatly from Stiegler's views of technology as prosthesis because they remain separate from humanity.

Understanding Stiegler's idea of humanity's technological condition, which is the most fundamental aspect of his distinctive view of technology, is by far the most important concept one must grasp to be able to distinguish Stiegler's views from his continental predecessors' and those of the contemporary American. However, the question of how this idea influences the discussion of the problem of Technological Determinism cannot be fully answered without a further explanation of the way in which the human technological condition manifests in contemporary education and society. Thus, it is not only important to understand Stiegler's idea of humanity's original or,

'originary' technicity, but also to know how humanity's bio-/techno-evolutionary or, epiphylogenetic nature 'works' in daily life.

To do this, requires a detailed look at what it means for humanity to *live technically* or, *transform* as technical beings by means of their continuous expression or, *exteriorization* via technical extensions or, *prosthetics*. The process by which humanity lives a technologically conditioned life, Stiegler maintains, is *pharmacological*.

> Technologies are inherently pharmacological—that is, they possess the ambivalent qualities of the pharmakon, signifying both remedy and poison at the same time, posing as much potential benefit as potential risk. (2011b, p. 27)

For Stiegler, humanity's technological condition is *pharmacological*. He explains that when as technical beings, individuals exteriorize themselves through technologies or, 'organized inorganic matter,' the result of that action can be either *beneficial* or *harmful*, just as if a medicine can have a *curative* or *poisoning* affect.

Dividing the Human from the Technical

Stiegler argues that since Western education began with the establishment of the first Academy in Ancient Greece, educators have been perpetuating a problematic view of technology through their scholarship. According to Stiegler, it was at this time that the first educators redefined the original view of technology. The newly established view of technology broke the original idea of technology into smaller, independent concepts that are still in use today. At the heart of this is a distinguishing of the technical, *how*

(represented by the Ancient Greek *techne*), from the human, *what* and *why* (represented by the Ancient Greek *phronesis*[4] and *episteme* respectively).

Stiegler views what can be considered, a disarticulation of the original Ancient Greek view of technology as so central to his work that it makes up the opening lines of his first and most important work, *Technics and Time 1: The Fault of Epimetheus* (1998).

> At the beginning of its history philosophy separates techne from episteme, a distinction that had not yet been made in Homeric times. […] It is in the inheritance of the conflict — in which the philosophical episteme is pitched against the sophistic techne, whereby all technical knowledge is devalued — that the essence of technical entities in general is conceived. (1998, p. 1)

Scholar of philosophy, technology, and the digital humanities, Frederica Frabetti explains that for Stiegler, philosophy began in Ancient Greece with a distinguishing of technology from humanity. She describes how Stiegler's view of technology speaks to the pre-Aristotelian, unified ideology of the relationship between the human, and the technical that was changed with the birth of philosophy and the Academy and that continues in America today. Stiegler's most important writings explain how the change occurred, and what impact it has had on individuals, education, and society. Frabetti also explains the

---

[4] Though phronesis as an element of technology is not directly discussed in Stiegler's earliest writings its importance for education cannot be overstated. For this reason, it has been included in this study.

.

distinctions made concerning the conceptual separating of techne from phronesis and episteme, emphasizing that the disarticulated view of technology has dominated Western civilization for over two thousand years:

> The traditional, Aristotelian view is that technology is extrinsic to human nature as a tool, which is used to bring about certain ends. Technology is applied science, an instrument of knowledge. The inverse of this conception, now commonly heard, is that the instrument has taken control of its maker, the creation control of its creator (Frankenstein's monster). Thus, the utilitarian model of technology, which is still in use today, has its foundations in Aristotelian thought. (2011, pp. 12–13)

While Stiegler points to the split of *techne* and *episteme* as the sole reason for the problems of technological autonomy and agency, others like Joel Mokyr (2002, 2005) and Keith Grint (2007) point out that Aristotle's writings include the additional quality, *phronesis*. Grint described the three concepts that, together, makeup the original ideology of technology:

- *Techne* refers to the functional, to things that do not have their own inner purpose. Their purpose is to produce other things. It speaks to the question of how something is being done and represents technical knowledge.
- *Phronesis* refers to the practical. It is a reasoned approach to addressing issues of lived experience. It speaks to the question of *what* is being done and represents *practical* knowledge.

- *Episteme* refers to purpose. Unlike techne or phronesis, episteme is in no way prescriptive; it is abstract and analytic. It speaks to the question of *why* something is being done and represents *wisdom*.

Simply put, Aristotle's view of technology requires human context. A reference to technology must not only answer the practical, *what* is being done; but, the functional, *how* something is being done; and the purposeful, *why* something is being done. In other words, to discuss technical issues, one must comment on the method they are using, what they are trying to accomplish, and the reason or, why they are trying to accomplish it.

Educators' discussions of technology often include only the *functional* aspects of technology use while neglecting to include information about the 'human' or, *practical* and *purposeful* aspects of that use. That is, educators often discuss only *how* something is to be done while leaving out *what* is to be done and *why*. It is a limited view of technology that separates the technical from its human context.

CHAPTER III

STUDY METHODS AND PROCEDURES

> *Content analysis is a widely used qualitative research technique. Rather than being a single method, current applications of content analysis show three distinct approaches: conventional, directed, or summative. All three approaches are used to interpret meaning from the content of text data and, hence, adhere to the naturalistic paradigm. […] With a directed approach, analysis starts with a theory or relevant research findings as guidance for initial codes.*
> (Krippendorff, 2004, p. 1277)

The purpose of this qualitative Directed Content Analysis is to ascertain whether the characteristics foundational to Technological Determinism are present in the writings of the top 10 most influential educational leaders of 2018; and, in doing so, identify the criteria that must be present when Technological Determinism is made manifest in discourse. This and the subsequent chapter of this study addresses the following research question:

- *How does Technological Determinism manifest in discourse and are those characteristics foundational to a determinist ideology of technology present in the writings of today's most influential educational leaders?*

Population and Data Collection

To identify the educational leaders who have the most influence on contemporary education, this study has looked to the *2018 RHSU Edu-Scholar Public Influence Rankings* (Education Next, 2018). According to these rankings, the 2018 most influential educational leadership scholars include such prominent educational leaders as Linda Darling-Hammond of Stanford, Howard Gardner of Harvard, University of Pennsylvania's Angela Duckworth, University of Wisconsin's Gloria Ladson-Billings, NYU's Diane Ravitch, Larry Cuban of Stanford, Temple's Sara Goldrick-Rab, University of Pennsylvania's Marybeth Gasman, Stanford's Jo Boaler, and University of Virginia's Carol Ann Tomlinson.

After the rankings were announced in 2018, Education Week published an article entitled, *The RHSU Edu-Scholar Public Influence Scoring Rubric* (F. Hess, 2018) detailing all aspects of the rankings. The following is a summary of his work. Edu-Scholar scored each scholar in eight categories with totals yielding a maximum score of 200. Table 1 shows the scores of the top 10 scholars that are the focus of this study followed by a detailed description of each of the variables scored.

Table 1: Top 10 2018 RHSU Edu-Scholar Public Influence Rankings

Rank	Name	Affiliation	Google Scholar	Book Points	Amazon Ranking	Syllabus Points	Newspaper	Education Press	Web	Congress Record	Klout Points	Total Score
1	Linda Darling-Hammond	Stanford	50.0	20.0	13.8	5.8	4.5	30.0	25.0	0.0	5.9	155.0
2	Howard Gardner	Harvard	50.0	20.0	14.8	10.0	11.0	16.0	25.0	0.0	5.9	152.7
3	Angela Duckworth	University of Pennsylvania	47.0	2.0	20.0	0.8	10.5	30.0	25.0	0.0	6.5	141.8
4	Gloria Ladson-Billings	University of Wisconsin	50.0	18.5	16.5	10.0	4.5	26.0	10.0	0.0	5.0	140.5
5	Diane Ravitch	NYU	37.0	20.0	17.4	5.4	1.5	28.0	17.0	5.0	8.2	139.5
6	Larry Cuban	Stanford	50.0	20.0	10.6	10.0	3.0	21.0	16.6	0.0	4.2	135.4
7	Sara Goldrick-Rab	Temple	24.0	3.0	14.9	0.2	30.0	30.0	21.9	0.0	6.4	130.4
8	Marybeth Gasman	University of Pennsylvania	30.0	16.0	11.6	0.6	25.0	19.0	20.0	0.0	6.3	128.5
9	Jo Boaler	Stanford	43.0	14.0	19.7	3.6	2.0	6.0	25.0	0.0	6.3	119.6
10	Carol Ann Tomlinson	University of Virginia	50.0	20.0	18.1	10.0	0.5	12.0	4.3	0.0	4.5	119.4

Google Scholar Score: The Google Scholar Score identifies the number of papers, articles, or books that were authored that were widely cited. Also known as the *h-index*, this method is a common way to measure the breadth and influence of a scholar's work. "The measure recognizes that bodies of scholarship matter greatly for influencing how important questions are understood and discussed" (F. Hess, 2018, § 1).

Book Points: The Book Points calculation queries Amazon to identify the number of books a scholar has authored, coauthored, or edited. "This measure reflects the conviction that books can influence public discussion in an outsized fashion" (F. Hess, 2018, § 2).

Highest Amazon Ranking: The Highest Amazon Ranking represents the author's highest-ranked book on Amazon. “The result is an imperfect measure, but one that conveys real information about whether a scholar has penned a book that is influencing contemporary discussion” (F. Hess, 2018, § 3).

Syllabus Points: The Syllabus Points Ranking measures the long-term impact that the scholars’ writings have on higher education, tracking the use of their works as course texts. “The score reflects the number of times that text appeared on syllabi” (F. Hess, 2018, § 4).

Education Press Mentions: The Education Press Mentions score tallies the total number of times a scholar was quoted or mentioned in *Education Week*, the *Chronicle of Higher Education*, or *Inside Higher Education* during 2017 (F. Hess, 2018, § 5).

Web Mentions: The Web Mentions calculation identifies the number of times a scholar was quoted, mentioned, or otherwise discussed online in 2018 “The intent is to use a “wisdom of crowds” metric to gauge a scholar’s influence on the public discourse last year” (F. Hess, 2018, § 6).

Newspaper Mentions: The Newspaper Mentions calculation uses a Lexis Nexis search to determine the number of times a scholar was quoted or mentioned in U.S. newspapers (F. Hess, 2018, § 7).

Congressional Record Mentions: The Congressional Record Mentions is a simple name search to determine whether a scholar had testified or if a scholar's work was referenced by a member of Congress (F. Hess, 2018, § 8).

Klout Score: The Klout Score tallies the Twitter activity of a scholar. The category identifies whether a scholar has a Twitter profile established and how often their Twitter activities are retweeted, mentioned, followed, listed, and answered. "Scores are designed to acknowledge scholars who are actively engaged in public discourse and whose work has an impact on practice and policy" (F. Hess, 2018, § 9).

Directed Content Analysis

Directed Content Analysis allows for the clear identification of the criteria by which a study's texts are analyzed, prior to their analysis. The explicit identification of these criteria not only gives additional context to the reader of a study but allows fellow scholars to validate their use. In a Directed Content Analysis, "analytical constructs operationalize what the content analyst knows about the context, specifically the network of correlations that are assumed" (Krippendorff, 2004, pp. 34–35). Krippendorff explains that, in a Directed Content Analysis, the texts that are analyzed are interpreted relative to pre-examined criteria that were developed through an interactive-hermeneutic process; whereby, "iteration continues until some satisfactory understanding is achieved. Understanding is the point at which the reading of texts resonates with the analyst's background" (2004, p. 303).

This study evaluates the writings of educational leaders to determine the presence

of those characteristics foundational to Technological Determinism. Specifically, this study identifies the granting of agency within the scholars' writings. As is detailed below, this characteristic of deterministic ideology is apparent when a reference to technology is written *adjacent to an active verb*. The question here is whether technology is referenced as '*doing*' something independent of human interaction. This characteristic speaks to the presence of reification and the granting of agency that are foundational to Technological Determinism (see, *The Cycle of Dis-Integration* above).

Marx (2010), McCarty (1997), and others have noted that, when a technology is written in a sentence adjacent to an active verb, that technology is ascribed with the autonomy and the agency to determine social life. For example, when one writes, 'the computers improved their grades,' the computers have been ascribed the ability to *determine* grades because they have been ascribed the power to 'improve' them. McCarty explains that, when 'technology' is used as the subject of an active verb, that technology is "personified, made not just into an 'autonomous agent' but to some degree into a person" (1997, Para. 5).

Marx has written extensively on the 'hazardous' nature of technology, identifying poor linguistics as the reason. In fact, Marx methodically links this improper linguistic expression of technology directly to Technological Determinism and, ultimately to an eventual 'social upheaval.' Marx also emphasizes that the expression of technology's autonomy, agency, and determinism is most often express 'tacitly,' without the writer even knowing that they are perpetuating the problematic Technological Determinism.

> We amplify the hazardous character of the concept by investing it with agency—by using the word technology as the subject of active verbs. [...] Here

> we tacitly invest a machine with the power to initiate change, as if it were capable of altering the course of events, of history itself. (Marx, 2010, pp. 576–577)

Goguen (2004) has established a course entitled, *Against Technological Determinism: Social Aspects of Technology and Science* that teaches students how to identify and eradicate Technological Determinism in their discourse and the discourse of others. He begins his classes with a brief description of both *Technological* and *Social* Determinism that can be simplified to two ideas: Technological Determinism as the theory that technology is an autonomous force that changes society, and Social Determinism as the theory that society is an autonomous force that changes technology. Goguen also points out that both Technological and Social Determinism come in a 'hard' and 'soft' form. With soft determinism the society or technology "is one influence among many, and not an absolute determinant, while the hard form claims that the force is sufficient in itself, i.e., is dominant and irresistible" (2004, 6.1).

He presents this as two distinct examples:

- *Cellphones will improve family life.*
- *Cellphones will help to improve family life.*

The first example expresses a 'hard' Technological Determinism, while the second expresses a 'soft' Technological Determinism due to the verb 'help' implying that there may be other causal factors involved.

The general form of a 'hard' Technological Deterministic statement is

T **=>** ***S***

In the example, ***T*** is a technological phenomenon and ***S*** is a social phenomenon; Here, =>

indicates implication. Likewise, the general form of a hard Social Determinism is

S* => *T

Likewise, 'soft' determinism manifests as

T1 and S1* => *S2

S1 and T1* => *T2

where ***S1***, ***S2*** represent social phenomenon, and where ***T1*** represents technological phenomenon; the first portraying a 'soft' Social Determinism and the second, a 'soft' Technological Determinism. Both the 'active verb' and Goguen's determining factors are used as part of the analysis in this study.

Examining 'Latent' Ideologies

> Karl Marx's understanding of ideology is summed up in the well-known phrase from his book *Capital: "Die wissen das nicht, aber sie tun es"* ("They do not know it, but they are doing it"). To put it more concretely, his idea is that society continues to function the way it does – people continue to do what they do (without revolt or protest) – because they do not know what's *really* going on behind the scenes. (Anderson, 2012, § 3)

Anderson (2012) explains that, for Marx, ideology is first a problem of knowledge and that the way to liberate those bound by the chains of ideology is to "show them that their understanding of reality is distorted" (Anderson, 2012, § 2). Anderson goes on to explain, however, that for Žižek, this solution may not be enough.

> Today the majority of people already buy into the idea that they are receiving a distorted version of reality [that] we are no longer the naive subjects that Marx

> supposed us to be [but] cynical subjects who recognize the distortions of ideology, and yet, do not reject the distortions. (Anderson, 2012, § 2)

Still, this is not the view of all. Stiegler and most others in this study are confident that the answer to addressing the problematic nature of Technological Determinism is to increase the awareness of its presence and its effect. We must focus not on technology, but on our ideology of technology. In other words, "technology is not what needs questioning; rather, the problem of modern society is a technological ideology" (Garrison, 2009).

Caldas-Coulthard and Couthard's (Caldas-Coulthard & Coulthard, 2013) examination of the use of Critical Discourse Analysis demonstrates its ability to address this problem and alleviate the concerns of the numerous scholars referenced above (Clegg, 2011; Garrison, 2009; Oostveen, 2007; Stiegler, 2003, 2014; Strobel & Tillberg-Webb, 2008; Wiesemes, 2009) that the latent ideology of Technological Determinism is becoming "a normative base of [educational] discourse" (Caldas-Coulthard & Coulthard, 2013, p. 11). Rahimi and Riasati point out that "the utmost objective of any Critical Discourse Analysis is to unravel the underlying hidden agenda which is left implicit in the discourse" (2011). And, Wilson explains, if we are to specifically analyze text to identify Technological Determinism, we must look to a "model for discussing […] technology which is structured by certain key assumptions or tacit principles" (Wilson, 2015, § 3).

Critical and Humanizing Framework

As its theoretical foundation, this study has embraced the *Critical and Humanizing Framework of Instructional Technologies to Educational Practice* of Strobel and Tillberg-Webb (2008). Their work establishes a basis for this study of Technological Determinism and "serves as the starting point for reflection on the impact of human interaction in educational technology practice" (2008, p. 2). Strobel and Tillberg-Webb emphasize the need for educators to critique their own beliefs about technologies and to look to strategies that will bring about student involvement and establish a sense of community. They begin by asking educators to focus not merely on the technologies they use but to consider the broader socio-cultural aspects of that use when evaluating their own views about technology.

Strobel and Tillberg-Webb emphasize that researchers "need to address the underlying ideologies that fuel research agendas and designs, as well as the design of learning experiences" (2008, p. 3). The scholars' research helps to establish boundaries within which the current study operates and make its readers better able to understand the ideas related to technical knowledge and technology use. The Strobel and Tillberg-Webb work establishes a framework for this study of Technological Determinism by explaining its relationship to Social Determinism and by laying out the problematic nature of such views from both a practical and value-laden standpoint.

After discussing the problematic nature of deterministic thinking about technology, Strobel and Tillberg-Webb explain that the rationale for completing their own study has to do with its prevalence in educational discourse. The authors cite studies by R. E. Clark (1983), Steven Ross and Deborah Lowther (2003), and J. Schacter (2012),

wherein the researchers establish a number of characteristic 'truths' when dealing with deterministic ideologies of technology taken from the literature of philosophy, technology, education, and sociology that makeup the specific characteristics of the framework:

- Question Technology

  The most important characteristic of the Strobel-Webb framework has to do with the emphasis on 'critical questioning toward our relationship with technology.' This is not a call to eliminate the use of technologies but one to critically reflect upon how technology use impacts discourse. If we fail to recognize and question the ways in which we let technology shape all aspects our culture - our language, our interactions with others, how we spend our time, etc., we are not only failing to question technology, we are blind to its sway over our lives. (2008, p. 8)

- Abandon the Fiction of the "Technological Fix"

  Educators must stop looking for a quick "technological fix" (2008, p. 8) and begin to look for a more comprehensive humanizing pedagogy that values student histories and subjective experiences.

- Integration of Theory into Practice

  Educators and Students Educators must become more aware of the relationship between the theoretical and the practical or, praxis; something that will allow educators to become more aware of their own agency and ability to effect

change when it comes to the embrace of technologies. (2008, p. 9)

- Examine Activity System and its Historicity

  Those embracing technologies for use in education must take into consideration the "activity system surrounding [the] technology use" (2008, p. 10). This includes any additional technologies, people involved, and goals and outcomes desired. In other words, educators must address *what* is being done and *why*, not just *how* it is being done.

- Think "Minds On"

  Focus must be on the use of computer-based technologies for the purpose of student engagement rather than merely giving them 'hands on' experience. Learning how to use a computer should not be the goal. Instead, using a computer for the purpose of learning must be. (2008, p. 11)

- Build Community

  "It is important for educators to look at websites and portal environments primarily for their social qualities rather than their digital content" (2008, p. 12).

- Relinquish Control

  It is important that educators not give up control of the learning process to technologies. This is what occurs when technologies are not considered as part of an overall model of instruction and when students are more familiar with

educational technologies than are those teaching them. (2008, p. 13)

The essential point of the scholars' writing is that it is important for educators to critique their own views of technology and, in doing so, bring together the human and the technical. A humanizing framework of technology empowers educators, allowing them to step out of the technology process and to critique their own beliefs about technology, creating an environment in which educators are able to discuss technical issues with one another. The goal of which is to speak and write as if *human beings are the focus of instruction, not technologies*; a re-focusing that will allow for communities of instruction.

CHAPTER IV

FINDINGS, RESEARCH, AND RECOMMENDATIONS

To this point, this study has explored the meaning of the two contrasting ideologies, Technological Determinism and Stiegler's unified view of technology; discussed the long-held concerns that so many have aired about the problematic effects on educational policy and practice; and explored how the embrace of Stiegler's view of technology can act as a remedy. Chapter IV of this study examines the presence of those characteristics representative of a deterministic thinking about technology. As explained above, there are several foundational characteristics within discourse that reveal the presence of deterministic ideologies of technology. This study analyzes two: First, this study looks to those foundational characteristics that represent a limited, dis-integrated expression of technology as merely *techne* as opposed to the unified ideology of technology espoused by Stiegler that speaks to an *integrated* and *infused* and *prosthetic* human/technical ideology that brings together the original *techne*/*phronesis*/*episteme* relationship. Second, this study looks to the granting of agency to technology represented by the use of *technology adjacent to an active verb*. In addition to this, to add context, this study examined any explicit bias for or against the use of technologies to determine if the presence of deterministic characteristics is present irrespective of one's expressed view of technology.

An Analysis of Scholars' Writings

The following represent the study's research of each of the scholars' writings:

Darling-Hammond's Pro-Technology, Integrated View of Technology

Linda Darling-Hammond is just one of the many scholars studied that exhibits antithetical, agency-granting references to technology despite revealing an explicit pro-bias and integrated view of technology. Since 2006, Darling-Hammond has overtly touted the value of technology to "support instruction" (2006, p. 278), "fuel growth" in education (2015, p. 3), and "improve student outcomes" (2017, p. 165). Moreover, in her most recent work entitled, *Education and the Path to One Nation, Indivisible*, the scholar emphasizes a concern that "in a technological, knowledge-based economy" too many are missing out on its value (2018, p. 10).

This pro-technology bias is accompanied by an expansive embrace of an integrated view of technology. Throughout Darling-Hammond's writings is a unifying description of the relationship between humanity and technology in that there is a "reinvent[ing of] both technologies and ways of doing business" (2016, p. 204). There is an explanation of the human/technical relationship as an "ecosystem" (2014, p. 5) within which humans "interact" (2017a, p. 112; 2014, p. 5, 8, 13)**,** "integrate" (2017a, p. 45, 162), and "infuse" (2006, p. 276, 2016a, § 4, 2017a, p. 109; 2014, pp. 15–16). Darling-Hammond writes of a "blend[ing] of teachers, peers, and technology" (2014, p. 13) that one "adopt[s]" (2017a, p. 58), rather than adapts to.

However, despite Darling-Hammond's pro-technology inclinations and integrated ideology of technology, the granting of agency is still present throughout her writings as

technology is referenced adjacent to an active verb. The scholar writes of "our world being transformed by these new technologies" (2016b, § 1); "new technologies allow[ing] assessments to capture students' processes and strategies" (2014, p. 72); where "the computer 'takes over' for the teacher, present[s] information to students, […] provide[s] answers to factual questions" (2014, p. 6), and "can [help] design tasks" (2017b).

Gardner's Pro-Technology, Integrated View of Technology

Howard Gardner's writings display a bias for technology and an integrated ideology of humanity's relationship to it. Gardner makes his bias clear when discussing educational technologies and touts "the genius of the technology" (1999, p. 239). In his 2000 article entitled, *Can Technology Exploit Our Many Ways of Knowing. The Digital Classroom: How Technology Is Changing the Way We Teach*, Gardner details his enthusiastic embrace:

> The new technologies make the materials vivid, easy to access, and fun to play with-and they readily address the multiple ways of knowing that humans possess. Moreover, for the first time ever, it is possible for teachers and other experts to examine the work efficiently, at long distances, and to provide quick and relevant feedback in forms that are useful to students. (2000a, p. 33)

This pro-technology bias is accompanied by an integrated ideology of the human and technological. In fact, Gardner uses the terminology expressed by Stiegler when he writes of "technological prosthetics actually improv[ing] classroom performance and lead[ing] to deeper understandings" (2011, p. 240). Gardner discusses humanity's

"relations to technology" (2013, pp. 53–54) as a "tethering to technology [that] create[s] an idealized digital representation of self" (2013, pp. 161–162). This human/technical connection is described as a "synthesis" (2008, p. 70) between the two.

Both the pro-technology and integrated view are offset by numerous agency-laden references. Gardner seems to glorify technology while still giving it agency, exclaiming that "the growing power and versatility of computers is […] legendary" (2011, p. 33) that "technology has revolutionized the world" (2000b, p. 30) by "alter[ing our world]" (2011, xvi). Gardner shares that "technology has played a central role in creating today's globalized world" (2013, p. 89) with "new technologies and powerful market forces chang[ing] the ways in which people work" (2009, p. 75). He describes "technology's facilitating role in maintaining high levels of contact between youth and their parents" (2013, p. 85) and that,

> Internet-enabled cell phones, tablets, and laptops-each with their arsenal of apps for all occasions-have altered what can be said, where, and to whom. Perhaps the most notable change is the constancy and immediacy of communication made possible by mobile technology. (2013, p. 93)

However, technology's agency is not always expressed in a positive way. Gardner refers directly to the issue of Technological Determinism when writing of Mumford and Ellul's "chilling portrait [of technologies] operat[ing] primarily on their own […] recreat[ing] human psychology" (2013, pp. 18–20) and it "affecting [human] consciousness" (2013, pp. 37–38). In the following passage, Gardner questions the meaning and value of artificial intelligence, concerned that "technologies undermine or unduly distort practice" (2016, p. 81):

> Artificial intelligence and virtual reality are two computer-related technologies that may cast a large shadow on education. Much of school planning may be done not by human agents but by programs created by human agents [….] One can ask: What is the truth value of materials prepared entirely by nonhuman entities? (2000b, p. 31)

Duckworth's Anti-Technology, Dis-Integrated View of Technology

Angela Duckworth joins Ravitch as the two scholars studied who hold an anti-technology bias toward and dis-integrated ideology of technology. At the heart of Duckworth's stance against 'technology' is her concern about the effects of technology use on children:

> Children's media and technology use is rapidly increasing, but there remains little evidence on the positive effects of such media on children's development, especially for very young children. Many studies have found persistent negative effects of extended television and media viewing on children's short- and long-term development. (2018, p. 284)

Duckworth bolsters her concerns by citing "actual scientific studies showing that increasingly as people rely on technology to do simple tasks, their grasp of basic skills can atrophy" (2014, p. 563). This aversion to technology can be understood as part of the 'cycle of dis-integration' discussed in the Chapter II wherein humanity is viewed separate from technology. Rather than a unity of the human and the technical, technology is seen as distinct. Duckworth gives examples of technology as a discrete 'tool' for researchers (2015, p. 520) and for assessing student interventions (2013,

p. 890).

Nevertheless, like the other scholars in this study, the granting of agency is still present in Duckworth's writings. She writes of technology as a 'distractor' for students, citing a

> study in which middle, high school, and college students were observed studying for 15 min in their homes found an average of between two and three visible technology-related distractors […] On average, students in the study studied fewer than 6 min before switching to technological distractors. (2014, p. 206)

Duckworth also writes that "modern technology [has] created a world [of] short-term pleasures" (2014, p. 315) and of its adverse 'influence' on childhood development (2018, p. 282).

Ladson-Billings' Pro-Technology, Integrated View of Technology

> I remind my audiences that we are teaching the brightest, most creative children the world has ever seen. And we are teaching them in a time of amazing technology and rapid change. (Ladson-Billings, 2009a, p. 177)

So, writes Gloria Ladson-Billings about the exciting value she sees as part of a world embracing 'technology,' though Ladson-Billing's enthusiasm is tempered by the 'incredible differences' between those who have experienced the introduction of today's technologies and those who were born into today's world where 'technology' is prevalent (2013, p. 106). The scholar makes clear her deep desire that education "can and will take into account major changes in technology [that will] radically reorient our

thinking about public schooling" (2015, pp. 107–108).

Ladson-Billings joins most of the other scholars in this study to express a unified or integrated ideology of technology. The scholar places a great emphasis on global issues: "technology has afforded the West unique and powerful influences in the world" (2003b, pp. 6–7), while also revealing a global racial divide (2003a, p. 8). Ladson-Billings writes numerous times of "highly technological nations" (2009b, pp. 353–354, 2015, pp. 106–107), which echoes Stiegler's view that humanity is essentially 'technical.' The scholar also discusses her own relationship with technology when she exclaims "I chose to integrate my 'scholarly' tools with my knowledge of my culture and my personal experiences" (2009a, xvii).

Like the others in this study, Ladson-Billing's references to technology allow for agency. The scholar stresses the effect technology advances have had on education. Technology has been the catalyst for student change and development (2013, pp. 106–107), has caused a differentiation between generations and a widening of the gap between those of differing income levels and race (1998, pp. 20–21), and has altered our meaning of literacy by "allow[ing] the average person to take in and process a vast amount of information without actually reading it" (1992, p. 318).

Ravitch's Anti-Technology, Dis-Integrated View of Technology

No one in this study has exhibited a greater disdain for technology and its advancement than Diane Ravitch. For almost two decades the scholar has aired her concerns about technology's effects on culture and education. In 2001, the scholar wrote that "the fruits of technology contribute to the debasement of culture" (2001, p. 222) and

that “technological changes [have] undermined the family” (2001, p. 456). Acknowledging the backlash that she may get by airing her complaints about the value of technology, Ravitch writes that “to speak ill of technology and the marvels of our digitized world comes close to a sacrilege. And yet I must” (2016, pp. 286–287). Her angst is made clear in her discussion of what she entitled “The Technology Hoax:”

> Then we hear that technology is going to bring about amazing progress. We see the ads on TV and the Internet for customization, personalization, and individualization. […] They also want to see new technology and to replace teachers with technology. That is the golden fleece they are looking for: a classroom with 100 children in front of computers, managed by a classroom aid, and no one has any professional training because it’s not necessary. (2014, p. 156)

This disdain is clear in the scholar’s view of technology companies when she writes that “the tech industry wields its money in dubious ways to peddle its product” (2017, § 6). And, while there are references in the scholar’s writings that speak to the pharmacological aspects of technology espoused by Stiegler, statements that speak transformation of American education “for good and for ill” (2013a, para. 1) and that “the rise of digital technology [is a] power for both education and distraction” (2016, pp. 261–262), Ravitch touts prophesies foretelling that “modern technology would make it possible to launch an age of plenty if only educators were willing to abandon individualism, competition, and capitalism build[ing] ‘a new tradition in American life’” (2001, pp. 216–217). Along with her anti-technology bias, Ravitch expresses a dis-integrated ideology of technology. Like Duckworth, who writes of the distinction

between the human and the technical by expressing an ideology of technology as a 'tool,' Ravitch asks us "not to forget that computers are tools, not an end in themselves [and that] efforts to find a technological shortcut only exacerbate students' failure to apply themselves to the serious business of learning" (1998, p. 134).

Examples of the granting of agency are prevalent in the writing of Ravitch. The scholar discusses economists' recognition of "profound changes wrought by new technologies" (2011, pp. 120–121) with the American economy going through a "major restructuring because of new technologies" (2011, p. 114), "chang[ing] the way people live around the globe' (2013b, p. 39). Still, Ravitch does not avoid sharing the 'ills' of technology's advance such as "the outsourcing of many kinds of jobs" (2013b, p. 95). For education, the scholar points out the value of technology to assess student ideology, where "computers make it possible to assemble the annual test scores of thousands of students and quickly analyze which students gained the most, which gained nothing, and which lost ground on standardized tests" (2016, pp. 186–187).

Technology has the ability to perform numerous tasks "from delivering content and instruction, to providing tools to track and organize progress through lessons, to giving access to communities of fellow teachers and learners" (2007, p. 131), and "hold teachers accountable for the rise and fall of their students' scores" (2016, p. 160). Technology advances define our means of communication making the accuracy of our expression more important than ever (2000, xxii). Virtual technologies "give students, families, educators, and administrators compelling ways to define and solve problems, and thus help educate productive citizens for a free society" (2007, p. 146). Ravitch writes that these online resources are able to "give shape and consistency to the work of

a growing network of teachers and schools dedicated to implementing creative approaches to effective liberal arts instruction in the classroom" (2007, p. 135).

Cuban's Pro-Technology, Integrated View of Technology

Since the mid-1990s, Larry Cuban has been speaking directly to the value and challenges of 'technology' in education. In his 1995 work, *Tinkering Toward Utopia*, Cuban details America's desire to solve educational challenges through the use of technologies as far back as the nineteenth century; writing that, "reformers have turned to machines when they were concerned about the competence of teachers, or the high cost of schooling, or some external threat to American security or prosperity that gave special urgency to education" (1995, p. 121). Sharing his own views of the value of technology in education in 1995, Cuban explained that, "the educational potential of the computer is already apparent, but the jury is out on how soon and how extensively the computer will be incorporated in everyday instruction" (1995, p. 126). The scholar does express this hesitancy when he points out that the "persistent dream of technology driving school and classroom changes has continually foundered in transforming teaching practices" (1996, § 1).

Douglas Levin, in his, *Prove IT: What Does the Research Say About Technology in Education?* writes the following about Cuban: "Sometimes described as a "critical friend of tech enthusiasts, Cuban raises some challenging points when it comes to technology in the classroom" (Levin, 2012, p. 2). This optimistic, yet realistic view of technology can be seen in all of Cuban's writings throughout the years. In his 2001 *High Access and Low Use of Technologies in High School Classrooms: Explaining an*

Apparent Paradox, he discusses the innovation of the overhead projector (2001, p. 814), students' ability to "conceptualize and actualize ideas using technology as their medium" (2001, p. 814), and how "policy makers believe that creating abundant access to new technologies in schools will lead to increased teacher use in classrooms, which will lead to better teaching and learning" (2001, p. 816). And, while Cuban does air concerns that the technologies may be "sustaining rather than transforming prevailing instructional practices" (2001, p. 817), he also maintains that research show that "there [are] students whose lives changed with increased access to technology" (2001, p. 823). A year later, in his 2002 work entitled, *Techno-Promoter Dreams, Student Realities*, Cuban acknowledged that "much of [technology's] mystique remains" (2002, p. 474) but that "few teachers and their students were on the leading edge of technology use" (2002, p. 475). Yet, Cuban's 'hopeful' emphasis about technology can be seen in students' ability to "find not only satisfaction using school technology but empowerment" (2002, p. 476) and "how important computers had become in their lives" (2002, p. 477).

Seven years later, Cuban discussed his concerns that technology's value has not become a reality. In his 2009, *Oversold and Underused*, he emphasized that there continues to be "an abiding faith in their contribution to technological progress" (2009b, p. 29) it is not reaching its full potential:

> Once schools were wired and equipment was in place, policymakers assumed, teachers and students would use the information technologies regularly in classrooms, and once computers were used regularly in schools, the desired outcomes, divergent as they were, would naturally follow. In short, access to technology would lead to instructional use, and use would lead to achievement

of the goals. (Cuban, 2009a, p. 20)

Cuban points out two issues holding back the anticipated progress; the first, that urban schools have not been able to access new technologies; and the second, that the overall use of classroom technologies have been limited and irregular (2009a, p. 86). Years after that, Cuban again spoke to the value of technology in a give-and-take discussion of technology's often unrealized potential in *The Dubious Promise of Educational Technologies: Historical Patterns and Future Challenges*.

> [Questioner]: Do you think that this 'new state of the self' has the potential to challenge the ways that information and communication technologies are currently being used in education?
>
> [Cuban]: Yes, I do. The potential is there. (2015, p. 429)

Cuban's integrated ideology of technology can be seen in his writings as a collaboration between the human and technical where "new technology depends in good part on the ability of technologically minded reformers" (1995, p. 126). The scholar, like others in this study, writes about the "infusion" of technology (2002, p. 474) and how technology use is tied to "innovative approaches" (2009b, pp. 68, 141, 158). Technology is an 'integral' part of the educational process (2009b, p. 71) that, "if applied thoughtfully and well-integrated into a curriculum, can be utilized as a helpful tool to assist student learning, provide access to valuable information, and ensure a competitive edge for our workforce" (Cuban, 2009b, p. 71). Cuban writes of the 'adoption' of various classroom technologies (2013, p. 113) that "enhance teaching" (2002, p. 475) and "support, rather than alter, existing teacher-centered practices" (2002, p. 477). This integration can be seen in the various ways in which Cuban links technology to human activity. There is the

discussion of a “technology-rich experience” (2002, p. 475) and “cybereducation” (2008, p. 243). Technology is ‘reforming’ schools (2009b, p. 1) and ‘transforming’ classroom practice (2013, p. 114).

> In my judgment, then, describing and analyzing the past, particularly the nexus between new technologies and schooling, is needed even more to inform policymakers, practitioners, and researchers. (2015, p. 427)

Even with this, in Cuban’s works there are examples of the granting of agency to technology. When writing, for example, of the impact that junior high school may have played during the Great Depression in the lowering of drop-out rates, he describes how “technology [had] eroded the need for youthful labor**”** (Tyack & Cuban, 1995, p. 72). And, when comparing the views of Ivan Illich on education in the 1960s and 1970s and those of the views of today’s ‘technological enthusiasts,’ he explains that “much of [Illich’s] ire directed at formal public schooling still exists, but now technology has made it possible for students to learn outside school buildings” (Cuban, 2008, p. 243). Thus, even while emphasizing the problematic deterministic ideologies of others throughout his writings, Cuban still uses references to technology in his own that reflect the same.

Goldrick-Rab’s Pro-Technology, Integrated View of Technology

While the writings of Sara Goldrick-Rab offer fewer examples of commentary on technology than the others in this study, they too comply to those ideologies, views, and agency-granting practices discussed in those writings. Goldrick-Rab reveals a ‘pro-technology’ bias in the way she expresses satisfaction with the improvements of online technology and the corresponding “ability of students and faculty to operate in online

environments" (2010, p. 28) and her hope that, 'using technology,' in the redesign of instructional approaches will **"** achieve cost savings as well as quality enhancements" (2010, p. 23). Goldrick-Rab writes of how the work of qualified technologists can result in the "transformational change of individuals' lives" (2013, p. 6); touting technology's ability to reach a broad swath of students (2013, p. 6) and giving examples of how technology can positively affect the way in which faculty and staff interact with students (2014, p. 30) improving student retention (2014, p. 1).

Goldrick-Rab is explicit about her ideology of the unifying or integrated quality of the human and technical. The scholar writes of this unity in her 2013 work entitled *Clearing the Path to a Brighter Future: Addressing the Barriers to Community College Access and Success* when emphasizing the relationship between "people plus technology" (2013, p. 6). For the scholar, technology is a critical component of instructional success; however, she also stresses that technology alone cannot get the complete the task (2013, p. 6). She writes that, "technological improvements to classrooms that must accompany innovative teaching practices" (2010, p. 449) and that these practices must involve those who are "specially trained people with advanced technology" (2013, p. 6). Technological advancement within the school must involve a combination of technology and social and educational services to positively impact instruction (2014, p. 1) and "plans to increasingly align training, technology and supportive services with this broader need" (2014, p. 31).

While not prevalent in her writings, Goldrick-Rab's works still include instances of the underlying characteristics of Technological Determinism in the granting of agency. This can be seen in comments of how technologies "enable staff to do their

work more efficiently or with greater precision" (2014, p. 29) and the ways in which "technology can facilitate person-to-person communication to help students navigate difficult processes like applying for financial aid" (2014, pp. 39–40).

Gasman's Pro-Technology, Integrated View of Technology

The following are examples of Marybeth Gasman's writings pro-technology bias, integrated view of technology, and distinct expression of the underlying characteristics of Technological Determinism; for, she almost stands alone in showing some seeming awareness to deterministic thinking in discourse. As to her emphasis on the value of technology, Gasman writes of educational institutions' ability to serve the needs of their students through technological advancements (2011, p. 725). The scholar focuses on this value for two specific audiences, developing countries and historically black colleges. Gasman points to specific technology ventures designed to aid students in developing countries to obtain jobs and partnerships with companies of industrialized nations (2016, p. 485) and, in doing so, show the positive impact of available technologies (2004, p. 52). Furthermore, Gasman writes extensively on the importance of historically black colleges "to be academically proficient, finically solvent and technologically sufficient" (2007, p. 128), stressing how desperate many are for access to today's technologies (2015, p. 134)

Gasman's ideology of the shared nature of humanity and technology is also evident in the numerous examples of her uniting the two in her writing. The scholar explores the vital importance of technology but only as part of a collaboration within individual relationships (2012, p. 13). School operations must include both "strong

leadership and up-to-date technology" (2006, p. 110). With an emphasis on the challenges unique to historically black colleges, Gasman writes of their need to "connect the academic curriculum to new technologies and workforce development" (2016, p. 6). Their faculty must "employ more active pedagogy, solicit feedback, [and] use new technologies" (2017, p. 184) to provide quality educational experiences including the use of social media to engage students (2016, p. 580). Gasman also refers on numerous occasions in her work entitled *Examining the Potential of Massive Open Online Courses (MOOCs) at Historically Black Colleges and Universities (HBCUs)*, to the bringing together of the human and technical to form a uniquely unified entity through 'adoption' and 'integration' (2016, pp. 482-487).

As to the granting of agency to technology, Gasman does discuss 'giving credit' to technology for successes in education when writing of the "the rise of technology on college campuses" (2016, p. 481) but emphasizes the problematic impact of the "tendency in education today […] to shape malleable young people to serve the needs of technology" (2002, p. 19). It is passages like these that reveal Gasman's almost unique seeming awareness of the problematic nature of Technological Determinism in her references to technology in this study.

Ann Tomlinson's Pro-Technology, Integrated View of Technology

For Carol Ann Tomlinson, technology offers contemporary educators and educated "an embarrassment of riches in opportunities to enliven teaching and learning" (2013, p. 89). Today's access to technology "opens classrooms to the world and to a world of ways to think about teaching and learning" (2014, vii). According to

Tomlinson, educators can now create extensive support systems that bring together people and technologies that are able to influence the classroom, school, and community (2001, p. 77) as well as explore and express new meaning with students (2009, pp. 31–32) and deal with a range of student readiness, interest, and learning profiles (2011, p. 82). The scholar underscores the value of mobile technology that "holds the possibility of making teaching more efficient and manageable" (2015, p. 86), giving educators the ability to "engage learners in astounding ways" (2015, p. 86) by personalizing or differentiating instruction.

Tomlinson's endorsement of the value of technology is one grounded in the unification of the human and the technical. Technology is only part of the collaborative environment that allows for effective educational policy and practice (2006, p. 9). Whether it is the brining together of "artifacts, visuals, print materials, and interviews with technology as research materials" (2008, p. 50) or technology used in conjunction with manual techniques to ensure data preservation (2008, p. 315), educators are encouraged to "support [their] students' use of varied modes of expression, materials, and technologies" (2017a, p. 149). The ultimate goal is to "create extensive support systems by using the people and technologies in your classroom, school, and community, thus giving everyone a chance to reach higher, learn more, and contribute to one another's learning" (2017a, p. 131).

Like the others in this study, despite Tomlinson's view of the value of technology or its relationship to humanity, the granting of agency remains. New technologies are credited to "open paths to a level of practice we hadn't really believed we could achieve" (Tomlinson, 2015, p. 87), that technology allows students the ability

to more effectively solve problems (2011, p. 169), and will transform medicine (2014, p. 32) and data interpretation (2008, p. 315). Mobile technology can revolutionize teaching and learning by "blow[ing] open the classroom, restructure it, reinvent it, lift[ing] it out of its 19th century educate-the-factory-workers orientation and [firmly planting it] in a 21st century mode" (2015, p. 86). Tomlinson continues to praise the ability of mobile technology to "engage learners in astounding ways as it links kids to real people, working on real issues, in the real world, [and] enable collaboration among learners in a wide variety of ways, helping them build on one another's strengths" (2015, p. 86). This enthusiasm is summed up in the following passage from Tomlinson's latest work entitled, *Let's Celebrate Personalization but Not Too Fast*:

> The shiny mechanisms of technology will work to make every student a skillful reader and an adept mathematician. Teachers will be less stressed. Presumably, life at home will improve as well once parents are freed from monitoring Common Core math assignments. Sign us all up! The opportunity seems too good, too timely, to pass up. (2017b, p. 10)

Boaler's Pro-Technology, Integrated View of Technology

Jo Boaler's appreciation of the value of technology is evident in the scholar's latest works wherein there is an excitement expressed of "our new technological world" (2014, 11). It is a world in which new technologies give educators and researchers new capabilities to access resources like never before allowing them to "cross the research-practice divide" (2016, pp. 179–180) and where new technologies provide access to important research evidence on any number of new fields and practices (2014, 6). Here,

value is placed not on an ability to memorize or calculate, but on those who can "reason about approaches, estimate and verify results, produce and interpret different powerful representations, and connect with other people's […] ideas" (Boaler, 2014, 11).

Boaler's integrated ideology of the human/technical relationship is clear from the use of 'technological' as an adjective to describe our world. This 'new technological world' is one in which technology is "pervasive in our jobs and lives" (2008, p. 56). Writing of technology's influence on mathematics, Boaler explains that "almost all new jobs in today's technological world involve working with massive data sets [and] asking questions of the data and reasoning about pathways" (2015, p. 29), which is all the more important in an increasingly technological and global economy wherein quantitative reasoning capabilities are a must (2006, p. 365). This unified view of the human and the technical is particularly evident when Boaler is discussing the need in America for students to have a broader ideology of their subject matter if they are to fill the various jobs of today's 'technological age' (2008, p. 57), to take part in the "technological advancement of society" (2008, p. 3), and to secure "our scientific and technological future" (2017, 6).

The divergence between the explicit views held as to the value of technology and its relationship with humanity, and the implicit deterministic ideologies of technology revealed in the granting of agency to technology through its use adjacent to an active verb, is present in Boaler's writings as it is in the others' in this study. It is evident in references that technology has given researchers the ability to expand their reach into new areas (2015, p. 1); that "new technologies are finally providing a way that important research evidence, on mathematics, learning, and the brain can reach the audiences that

need them" (2014, 6); "allow[ing] students to work at their own levels" (2015, p. 118); and "giving teachers access to research knowledge [that] are helping to cross the research-practice divide" (2016, pp. 179–180).

A Consideration of Findings

This study finds that, irrespective of a scholar's explicit bias for or against technology and whether a scholar has an integrated or dis-integrated view of technology, a foundational characteristic that underlies a deterministic ideology of technology; namely, the granting of agency, is present in their writings. While the scope of this study is not determinative of the broad normalization of Technological Determinism in educational discourse, it is evidence that these characteristics that underly this problematic ideology are present in the writings of the most influential scholars of our day. In other words, the findings of this study reflect those predicted by the numerous scholars who have aired concerns about the prevalence of Technological Determinism in educational discourse.

Recommendations for Future Study

Overall, the findings above paint an initial, albeit extremely limited, picture of the ways in which today's scholars view the value of technology within education and their ideology of its relationship to humanity. It also allows that, despite these views and ideologies, the characteristics foundational to Technological Determinism, namely the granting of agency, are present if not prevalent in their writings. This begs the question as to what more must be done to increase awareness about the problematic impact of

Technological Determinism on educational policy and practice and the concern that this problematic view of technology is becoming normalized in educational discourse. To address this, it is imperative that educational leaders and educational technologists take haste to begin a dialogue on this subject. In addition to this, added research is necessary to bolster the findings of this study. This should include continued research into the presence of the foundational characteristics underlying the view of Technological Determinism in a broader sampling of educators' writings.

Future study should also analyze references to technology to determine whether a reference to technology is *comprehensive* in that it is made up of *how* something will be done (*techne*), *what* will be done (*phronesis*), and *why* something will be done. For example, if a scholar references the use of a *Smartboard*, explaining merely *how* they are going to do something (*techne*), without also discussing what is being done (*phronesis*), nor why it is being done (*episteme*), they have neglected bringing together the human aspects of technology use like planning, implementing, training, support, and maintenance; opening the door for reification, agency, and deterministic thinking. This characteristic of discourse is at the very foundation of Stiegler's ideology of technology as it harkens back to the initial separation of the human from the technical referred to in the opening lines of his *Technics and Time: The Fault of Epimetheus* (1998).

Lastly, there is also an opportunity in future research to study any distinctions that might exist between the views and ideologies of technologists and academic scholars. Is there a distinction in the explicit biases for or against technology, do technologists have an integrated or dis-integrated of technology, and is the granting of agency present in the writings of technologists as well as educational leaders?

CHAPTER V

CONCLUSION

> *Examining one's ideological perspective in relationship to technology is an imperative for all educators, instructional designers, administrators, and learners. […] The importance of developing a humanizing framework of technology integration is in that it empowers each educator to critically evaluate his or her own beliefs about technology and to engage in a critical dialogue with other educators and learners about these beliefs.* (Strobel & Tillberg-Webb, 2008, p. 15)

Stiegler has been likened by some to Socrates, with his unkempt hair standing on end as he flits about like the notorious "gadfly of contemporary technological and mediatized society, capable of bringing acute poetic intelligence to an assessment of its limits and prospects" (D. Smith, 2013, p. 92). His over 20-year search for answers concerning the relationship between humanity and technology reveal the tremendous burden he continues to carry as an academic. In many ways Stiegler has come to resemble a contemporary prophet carrying a transformational message, a message that, from its introduction, links the theoretical, and the material. Stiegler is a proselytizer, trying to bring converts to a truth, to *real* answers with *practical* solutions for what ails humanity as it attempts to thrive in a new digital world.

> The object of this work is technics, apprehended as the horizon of all possibility to come and of all possibility of a future. […] Today, it informs all types of

> research, and the enormousness of the question summons us all. This calls for a work whose urgency is still hardly grasped despite the high stakes of the issue and the disquiet it arouses—a long and exacting task, as exciting as it will be difficult, stirring a necessary but deaf and dangerous impatience. (Stiegler, 1998, ix)

So writes Stiegler in the opening lines of the *Preface* of his most significant work, Part 1 of his three part opus, *Technics and Time, 1: The Fault of Epimetheus* (1998).

It is in this foundational work that Stiegler would first articulate the truths he had come to realize about what he calls *technics*. Here too, he would acknowledge the fundamental responsibility of educational leaders to oversee the expression of these truths within the Academy. If the purpose of a text's *Preface* is to allow the author to speak directly and candidly to their readers, to point out the significance of the subject matter, to add context, and to establish a framework for the work that follows, the opening lines of the *Preface* to Stiegler's, *Technics and Time* above exemplify that purpose. Stiegler uses these opening words to introduce what lies at the center of his thinking, *the unity of humanity and technology*. For Stiegler, the term *technics* represents this unification.

This study also has at its core the unity of humanity and technology. It embraces the urgency Stiegler exudes in identifying the writings of educational leaders as the *problem* in that they perpetuate a disarticulated notion of technology, and the *solution* in that they are the best means by which the message of a unified humanity and technology can persist. Stiegler insists that there is a 'high stakes issue,' a 'long and exacting task' to which he and those like him are 'called' even 'summoned' to address. The 'difficult' but 'necessary' task to which Stiegler refers is the *fundamental responsibility* discussed throughout this study that educational leaders must ensure their writings perpetuate a

complete view of technology that brings together the human and the technical and that is free from deterministic thinking about technology.

To truly understand the urgency exhibited by Stiegler, it is first necessary to understand what Stiegler refers to as '*tertiary retentions*,' the social memories that have been materialized as memory supports. They are the ideas we share, in physical form through writing, the book being the greatest example. For Stiegler, tertiary retentions are the building blocks of the human world. As discussed above, Stiegler considers these ideas in physical form, *pharmaka*, in that they can be either curative or poisoning. Hence, our writings can either have a beneficial or problematic effect on education.

Marshall McLuhan brought to the forefront a new form of determinism known as 'media' determinism. McLuhan coined the phrase, "the medium is the message" (2003, p. 12). He, like Stiegler, have looked to changes in discourse as the key to effectively eradicate Technological Determinism. More specifically, McLuhan and Stiegler have focused on the 'discourse that remains,' in the form of writing, print, audio and video; what Stiegler refers to as *mnemotechnics* (Barnet, 2004). Stiegler holds that the relationship between humanity and technology are best looked at as *shared* truths. That is, that they are ideas that are perpetuated through writing. In keeping with this, Stiegler's writings are often made up of collaborative exchanges of ideas, where he plays the roles of both speakers as he analyzes and articulates the views of prominent scholars like Rousseau, Kant, Husserl, Heidegger, and others in light of his own (Roberts, 2007, p. 26).

It is important to note the prominence that Stiegler places on the *quality* of the discourse surrounding technical issues. One can see this emphasis in the various methods he chooses to use to communicate his message. For though a prolific writer, many have

also come to know him for the numerous interviews, lectures, and activities he has taken part in to explain and promote his ideas. Any one of these modes of communication can be seen to reinforce his focus on discourse and the importance he places on his message. An excellent example of this can be found in the highly praised documentary about society and technology, *The Ister* (Barison et al., 2004). In it, Stiegler lends his voice to the philosophical views of Martin Heidegger. Here, the audience can see Stiegler sharing his thoughts; sitting forward in his seat, eyes opened wide, arms and hands gesturing to emphasize his points. This image of exuberance and intensity emanates from all Stiegler's works. Whether it is through an interview, a book, an article, the establishment of an organization such as *Ars Industrialis*[5] (2010), or the starting of a school like *Épineuil-le-Fleuriel*[6] (Pharmakon.fr, 2015), all of his works represent an attempt to explain what he holds to be true to a wider-ranging audience.

---

[5] Originally established in 2005 to find ways to articulate the philosophical and practical truths of its members; over its initial years of operation *Ars Industrialis* has taken on a much more activist stance. Appendix II represents the organization's initial and revised Manifestos.

[6] Stiegler began operation of this unique school of philosophy in the fall of 2010. The school offers both onsite and distance learning doctoral and post-doctoral programs. Stiegler operates the school to introduce its students to the truths he has come to embrace about the relationship between humanity and technology.

However, while there are some who acknowledge Stiegler's role in bringing a new and profound focus on humanity's struggle to engage with today's digital technologies, there are still those who question the quality and consistency of his message. An example can be found in the review of a recently released book on Stiegler entitled, *Stiegler and Technics* (2013). Its author, Dominic Smith writes:

> More recently, [Stiegler] seems to have fallen into some of the same paradoxes of overproduction that affect the work of Žižek - the more he produces, the less he seems to say; the more he repeats his core theses, the more one suspects a certain loss of focus. (D. Smith, 2013, pp. 92–93)

Smith compares Stiegler's efforts to those of Slovenian Marxist philosopher, Slavoj Žižek, who has been widely criticized for his unfocused and excessive writing. This study helps to demonstrate that Stiegler's works are, in fact, undeniably *focused*. Even his later works are noticeably redundant in that they too, re-introduce his central concepts.

One must merely compare Stiegler's earliest work, *Technics and Time 1: The Fault of Epimetheus* (1999) to his latest work, *States of Shock: Stupidity and Knowledge in the 21st Century* (2014) to see that the messages are the same. Of course, Stiegler has status and acclaim since his first work; outside of that' all that is different between his early works and latter is the purpose. Stiegler wrote the earlier to introduce the core elements of his unified vision of humanity and technology, and the latter to wake those responsible for the oversight of technical expression, *educational leaders,* from their slumber. The first is a text for guidance, the last *a call to arms*.

Stiegler argues that the cycle of dis-integration explained above that results in the problematic effects of deterministic thinking about technology *can* and *must* be attacked.

For Stiegler, the word *attack* is appropriate here as acting to stop the cycle is not merely 'academic' (in a derogative form) it is a 'real-life' *battle*. Stiegler shares this in a 2011 interview with Pieter Lemmens.

> My books want to serve struggles, Stiegler writes in one of his prefaces. The struggles he refers to are struggles in the context of a 'battle for the mind' […]. Philosophy, according to Stiegler, should engage itself in the global struggle for the mind […] that is systematically degrading and brutalizing human existence, destroying desire, intelligence, and the joie de vivre. (2011, p. 34)

Stiegler had written of the 'battle' a year before the Lemmens' interview in his work entitled, *Taking Care of Youth and the Generations* (2010). In it, Stiegler illustrates that, for the individual and the broader society, there is a "battle to emerge from immaturity, like butterflies emerging from the cocoon" (2010, p. 26). To reach this renewal requires a discarding of today's invalid ideologies of technology and re-embrace of technology's true, original meaning.

Those who specialize in technologies designed for education (I.e., educational technologists) have long known the importance of thinking deeply about technology and the responsibility of the Academy to disseminate its truths. The following statement appeared in the preface to the *1977 AECT Definition of Educational Technology* publication at a time when the question about the dissemination of concepts of technology was still in its infancy.

> I firmly believe that the future of Educational Technology is now in the hands of the thinkers. What is needed is a handful of experienced people who have thought widely and deeply, and who are obsessed by the problems posed. These people

> must have the ability to analyze and synthesize, and, in effect, to invent whole new conceptual frameworks. (AECT: Task Force on Definition and Terminology, 1977)

The development of a new conceptual framework is, in fact, what Stiegler has created. The question then, turns to the establishment of a place of discourse wherein references to technology are clear and result in technology adoption and positive technological transformation. *Where*, with *who*, and *how* will the improvement occur? The answer lies in the Academy (Iveson & Stiegler, 2012). When discussing, *where* the new ideology will take place, *who* will make it happen, and *how* it will occur, the answers point directly at educational leaders. The generation and perpetuation of *adoptive* views of technology must occur in colleges and universities, be generated, and maintained by educational leaders, and be propagated through their scholarship. It is here that "Stiegler feels we're failing one another" (Crutcher, 2010).

REFERENCES

Achterhuis, H. (Ed.). (2001). *American philosophy of technology: The empirical turn*: Indiana University Press.

Adler, P. S. (2008). Technological Determinism. In S. Clegg & J. R. Bailey (Eds.), *International Encyclopedia of Organization Studies.* Los Angeles, London: SAGE.

AECT: Task Force on Definition and Terminology. (1977). *The definition of educational technology*. Washington: Association for Educational Communications and Technology.

Anderson, A. G. (2012, September 11). Ideology: From Marx to Žižek (via Althusser and…Pascal?). Retrieved from https://sublimeobjects.wordpress.com/2012/09/11/ideology-from-marx-to-zizek-via-althusser-and-pascal/

Ars Industrialis. (2010, October 5). Ars Industrialis: Manifesto 2010. Retrieved from http://arsindustrialis.org/manifesto-2010

Barnet, B. (2004, March 16). Technical machines and evolution. Retrieved from http://www.ctheory.net/printer.asp?id=414

Best, K. (2009). When mobiles go media: Relational affordances and present-to-hand digital devices. *Canadian Journal of Communication*, *34*(3), 397–414.

Bingham, N. (1996). Object-ions: From Technological Determinism towards geographies of relations. *Environment and Planning D: Society and Space*, *14*(6), 635–657.

Blacker, D. (1994). Philosophy of technology and education: An invitation to inquiry. *Philosophy of Education Society Yearbook*.

Bluemink, M. (2015, March 24). Stiegler and Derrida: The technical history of memory. Retrieved from http://bluelabyrinths.com/2015/03/24/grammatisation-the-technical-history-of-memory/

Boaler, J. (2006). Urban success: A multidimensional mathematics approach with equitable outcomes. *The Phi Delta Kappan*, *87*(5), 364–369.

Boaler, J. (2008). *What's math got to do with it?: Helping children learn to love their most hated subject--and why it's important for America*. New York: Viking.

Boaler, J. (2014). The stereotypes that distort how Americans teach and learn. *The Atlantic*.

Boaler, J. (2017). Memorizers are the lowest achievers. *The Hechinger Report*. (May 7).

Boaler, J., & Dweck, C. (2015). *Mathematical mindsets: Unleashing students' potential through creative math, inspiring messages and innovative teaching*: Wiley. Retrieved from https://books.google.com/books?id=b0d_BwAAQBAJ

Boaler, J., & Sengupta-Irving, T. (2016). The many colors of algebra: The impact of equity focused teaching upon student learning and engagement. *The Journal of Mathematical Behavior*, *41*, 179–190. https://doi.org/10.1016/j.jmathb.2015.10.007

Borgmann, A. (1988). *Technology and the character of contemporary life: A philosophical inquiry* (Paperback ed., 3. pr). Chicago: Univ. of Chicago Pr.

Bradley, A., & Armand, L. (Eds.). (2006). *Technicity*. Prague: Litteraria Pragensia. Retrieved from http://www.worldcat.org/oclc/150360941

Brey, P. (2003). Theorizing technology and modernity. *Modernity and Technology*, 33–71.

Burnett, J., Senker, P., & Walker, K. (Eds.). (2009). *The myths of technology: innovation and inequality*. Retrieved from https://books.google.com/books?id=UYtuPhW8xLAC

Caldas-Coulthard, C. R., & Coulthard, M. (2013). *Texts and practices: Readings in critical discourse analysis*: Taylor & Francis. Retrieved from https://books.google.com/books?id=cuvQzgtH4lQC

Carr-Chellman, A. A. (2006). Critical issues in e-learning and implications for higher education. *Journal of Thought*, *4*(1), 95–119.

Chandler, D. (2014, July 3). Technological or media determinism: Technological autonomy. Retrieved from http://www.visual-memory.co.uk/daniel/Documents/tecdet/tdet06.html

Clegg, S. (2011). Academic identities re-formed?: Contesting technological determinism in accounts of the digital age. *Contemporary Social Science*, *6*(2), 175–191.

Couros, A. (2003). Innovation, change theory and the acceptance of new technologies: A literature review. *The Journal of Technology Transfer*, 4 (1), 1-13

Crogan, P., & Turner, C. (2010). Knowledge, care, and trans-individuation: An interview with Bernard Stiegler. *Cultural Politics*, *6*(2), 157–170. Retrieved from https://muse.jhu.edu/article/584273/pdf

Crutcher, P. A. (2010). Review of Taking Care of Youth and the Generations by Bernard Stiegler. *Education Review*, *13*.

Cuban, L. (1996, October 9). Techno-reformers and classroom teachers: Education Week on the Web.

Cuban, L. (2001). *Oversold and underused: Computers in the classroom*. Cambridge, Mass.: Harvard University Press.

Cuban, L. (2008). The perennial reform: Fixing school time. *Phi Delta Kappan*. (December), 240–250.

Cuban, L. (2009a). *The blackboard and the bottom line*: Harvard University Press. Retrieved from https://books.google.com/books?id=ZLnXz76wvoAC

Cuban, L. (2009b). *Oversold and underused*: Harvard University Press. Retrieved from https://books.google.com/books?id=sdSutyVQfzYC

Cuban, L., & Jandrić, P. (2015). The dubious promise of educational technologies: Historical patterns and future challenges. *E-Learning and Digital Media, 12*(3-4), 425–439. https://doi.org/10.1177/2042753015579978

Cuban, L., Kirkpatrick, H., & Peck, C. (2001). High access and low use of technologies in high school classrooms: Explaining an apparent paradox. *American Educational Research Journal, 4*(38), 813–834.

Cusset, F. (2008). *French theory: How Foucault, Derrida, Deleuze, & Co. transformed the intellectual life of the United States*. Minneapolis: University of Minnesota Press. Retrieved from http://www.worldcat.org/oclc/190876075

Darling-Hammond, L. (2006). *Powerful teacher education: Lessons from exemplary programs / Linda Darling-Hammond; in collaboration with Letitia Fickel ... [et al.]* (1st ed.). *The Jossey-Bass Education Series*. San Francisco, Calif.: Jossey-Bass.

Darling-Hammond, L. (2014). *Next generation assessment: Moving beyond the bubble test to support 21st century learning*: Wiley. Retrieved from https://books.google.com/books?id=XxYNBAAAQBAJ

Darling-Hammond, L. (2015). *The flat world and education: How America's commitment to equity will determine our future*: Teachers College Press. Retrieved from

https://books.google.com/books?id=lP32XQw0lKYC

Darling-Hammond, L. (2016a, September 20). A ninja's take on education policy: Interview with Linda Darling-Hammond. Retrieved from https://newtechnetwork.org/resources/ninjas-take-education-policy-interview-linda-darling-hammond/

Darling-Hammond, L. (2016b, September 1). A new moment in education: Huffington Post. Retrieved from https://www.huffingtonpost.com/linda-darlinghammond/a-new-moment-in-education_b_8073130.html

Darling-Hammond, L. (2017a). *Empowered educators: How high-performing systems shape teaching quality around the world* (First edition). San Francisco CA: Jossey-Bass.

Darling-Hammond, L. (2017b, August). *Benefits of technology for learning and assessment.* Coldham, S. Small Private Online Course (SPOC) 'Using Technology for Learning through Assessment and Feedback', University of Westminister. Retrieved from https://www.youtube.com/watch?v=SLjIpAGfVXg

Darling-Hammond, L. (2018). Education and the path to one nation, indivisible. *Learning Policy Institute, Chapter Brief* (February), 1–12.

Darling-Hammond, L., Falk, B. F., & Ancess, J. (2017). *Authentic assessment in action: Studies of schools and students at work*: Teachers College Press. Retrieved from https://books.google.com/books?id=KLo8DwAAQBAJ

Darling-Hammond, L., Ramos-Beban, N., Altamirano, R. P., & Hyler, M. E. (2016). *Be the change: Reinventing school for student success*: Teachers College Press. Retrieved from https://books.google.com/books?id=8M4oDQAAQBAJ

Darling-Hammond, L., Zielezinski, M. B., & Goldman, S. (2014). Using technology to support at-risk students' learning. *Stanford Center for Opportunity Policy in Education (SCOPE), September*, 1–18.

DCRC - Digital Cultures Research Centre. (2012). A bibliography of the English translations of Bernard Stiegler's Work. Retrieved from http://www.dcrc.org.uk/2012/02/01/bibliography-english-translations-bernard-stieglers-work/

Dillet, B. (2017). Proletarianization, de-proletarianization, and the rise of the amateur. *Boundary 2*, *44*(1), 79–105. https://doi.org/10.1215/01903659-3725881

Duckworth, A. L., Gendler, T. S., & Gross, J. J. (2014). Self-Control in school-age children. *Educational Psychologist*, *49*(3), 199–217. https://doi.org/10.1080/00461520.2014.926225

Edgerton, D. (1995). Review: Does technology drive history? The dilemma of Technological Determinism by Merritt Roe Smith; Leo Marx. *The British Journal for the History of Science*, *28*(3), 370–372.

Education Next. (2018). The 2018 RHSU Edu-Scholar Public Influence Rankings - full rankings. Retrieved from http://educationnext.org/2018-rhsu-edu-scholar-public-influence-rankings-full-table/

Ellul, J., & Merton, R. K. (1964). *The technological society: A penetrating analysis of our technical civilization and the effect of an increasingly standardized culture on the future of man*. New York, NY: Vintage Books. Retrieved from http://www.worldcat.org/oclc/475485337

Epictetus. (135 A.C.E.). *The Enchiridion*. Retrieved from

http://classics.mit.edu/Epictetus/epicench.html

Epictetus. (1916). *The discourses of Epictetus*. Evinity Pubishing Inc. Retrieved from http://www.sacred-texts.com/cla/dep/dep000.htm

Esters, L. T., Washington, A., Gasman, Marybeth, Commodore, F., O'Neal, B., Freeman, S., . . . Jiminez, C. (2016). Effective leadership: A toolkit for the 21st-centry historically black college and university president. *Penn Center for Minority Serving Institutions*. (Winter).

Feenberg, A. (2010). *Dr. Andrew Feenberg: Ten paradoxes of technology*. Canada Research Chairs Seminar Series, The irmacs Centre. Retrieved from https://www.youtube.com/watch?v=-HzJ_Jkqa2Q

First Run/Icarus Films (Editor), & Barison, D., Ross, D., Lacoue-Labarthe, P., Stiegler, B., Nancy, J.-L., & Syberberg, H. J. (Directors). (2004). *The Ister* [Video Recording]. Brooklyn, NY: Black Box Sound and Image.

Fischman, W., & Gardner, H. (2009). Implementing good work programs: Helping students to become ethical workers. *Knowledge Quest*, *37*(3), 74–79.

Frabetti, F. (2011). Rethinking the digital humanities in the context of originary technicity, *12*, 1–22.

Freeman, S., Commodore, F., Gasman, Marybeth, & Carter, C. (2016). Leaders wanted! The skills expected and needed for a successful 21st century historically black college and university presidency. *Journal of Black Studies*, *47*(6), 570–591. https://doi.org/10.1177/0021934716653353

Galla, B. M., & Duckworth, A. L. (2015). More than resisting temptation: Beneficial habits mediate the relationship between self-control and positive life outcomes.

Journal of Personality and Social Psychology, *109*(3), 508–525. https://doi.org/10.1037/pspp0000026

Galla, B. M., Plummer, B. D., White, R. E., Meketon, D., D'Mello, Sidney K., & Duckworth, A. L. (2014). The Academic Diligence Task (ADT): Assessing individual differences in effort on tedious but important schoolwork. *Contemporary Educational Psychology*, *39*(4), 314–325. https://doi.org/10.1016/j.cedpsych.2014.08.001

Galloway, A. R. (2011). Bernard Stiegler, or our thoughts are with control. In S. Resnick (Ed.), *French Theory Today: A pamphlet series documenting the weeklong seminar by Alexander R. Galloway at the Public School New York in 2010* (pp. 3–12). The Public School New York.

Gardner, H. (1999). *The disciplined mind: What all students should understand*: Simon & Schuster. Retrieved from https://books.google.com/books?id=ND8QAQAAMAAJ

Gardner, H. (2000a). Can technology exploit our many ways of knowing. *The Digital Classroom: How Technology Is Changing the Way We Teach and Learn*, 32–35.

Gardner, H. (2000b). Technology remakes the schools. *Futurist*, *34*(2), 30–33.

Gardner, H. (2008). *Five minds for the future*. Boston, Mass.: Harvard Business School Press.

Gardner, H. (2011). *The unschooled mind: How children think and how schools should teach* (2nd ed.). New York: Basic Books. Retrieved from http://gbv.eblib.com/patron/FullRecord.aspx?p=665794

Gardner, H. (2016). Is There a future for the professions? An interim verdict. *Hedgehog Review*, *18*(1), 74–87.

Gardner, H., & Davis, K. (2013). *The app generation: How today's youth navigate*

identity, intimacy, and imagination in a digital world: Yale University Press.

Gardner, H., & Laskin, E. (2011). *Leading minds: An anatomy of leadership*. New York, NY: BasicBooks.

Garrison, K. G. (2009). Technology studies and technical communication: Substantive rhetoric revisited (Dissertation). Cornell University, Ithaca, New York.

Gasman, M., & Bowman, N. (2012). *A guide to fundraising at historically black colleges and universities: An all campus approach*: Taylor & Francis. Retrieved from https://books.google.com/books?id=nOO8RZ5IuwMC

Gasman, Marybeth. (2006). Black colleges must tap alumni support. *Diverse: Issues in Higher Education, 23*(11), 110.

Gasman, Marybeth. (2007). Truth, generalizations, and stigmas: An analysis of the media's coverage of Morris Brown College and black colleges overall. *The Review of Black Political Economy*, *34*(1-2), 111–147. https://doi.org/10.1007/s12114-007-9001-z

Gasman, Marybeth, & Epstein, E. (2002). Modern art in the Old South: The role of the arts in Fisk University's campus curriculum. *Educational Researcher, 31*(2), 13–20. https://doi.org/10.3102/0013189X031002013

Gasman, Marybeth, & Epstein, E. (2004). Creating an image for black higher education: A visual examination of the United Negro College Fund's publicity, 1944-1960. *Educational Foundations, 18*(2), 41–61.

Gasman, Marybeth, Nguyen, T.-H., & Conrad, C. F. (2015). Lives intertwined: A primer on the history and emergence of minority serving institutions. *Journal of Diversity in Higher Education, 8*(2), 120–138. https://doi.org/10.1037/a0038386

Gasman, Marybeth, Nguyen, T.-H., Conrad, C. F., Lundberg, T., & Commodore, F. (2017). Black male success in STEM: A case study of Morehouse College. *Journal of Diversity in Higher Education*, *10*(2), 181–200. https://doi.org/10.1037/dhe0000013

Goguen, J. (2004). *Against Technological Determinism* (CSE 275: Social Aspects of Technology and Science). Retrieved from University of California, San Diego website: http://www.cse.ucsd.edu/~goguen/courses/275/s2.html

Goldrick-Rab, S. (2010). Challenges and opportunities for improving community college student success. *Review of Educational Research*, *80*(3), 437–469. https://doi.org/10.3102/0034654310370163

Goldrick-Rab, S., Broton, K. M., & Frank, V. M. (2014). *Single Stop USA's community college initiative: Implementation Assessment.*

Goldrick-Rab, S., Broton, K. M., & Gates, C. (2013). *Clearing the path to a brighter future: Addressing barriers to community college access and success*: Association of Community Colleges Trustees, pp. 1–12. Retrieved from https://vtechworks.lib.vt.edu/bitstream/10919/83035/1/ClearingAddressingBarriersCommunity.pdf

Grint, K. (2007). Learning to lead: Can Aristotle help us find the road to wisdom? Retrieved from http://cte.rockhurst.edu/s/945/images/editor_documents/GRINT%20Learning%20to%20lead%20Aristotle.pdf

Gunn, C., & Steel, C. (2012). Linking theory to practice in learning technology research. *Research in Learning Technology*, *20*(0), 455. https://doi.org/10.3402/rlt.v20i0.16148

Harris, D. N., & Goldrick-Rab, S. (2010). The (Un)Productivity of American Higher

Education: From. *Wisconsin Center for the Advancement of Postsecondary Education (NJ1)*. Retrieved from http://files.eric.ed.gov/fulltext/ED515051.pdf

Hesiod. (2009). *Theogony & Works and Days: Focus Classical Library*. Indianapolis, IN: Hackett Publishing Company.

Hess, F. (2018). The 2018 RHSU Edu-Scholar Public Influence Scoring Rubric - Education Next. Retrieved from http://educationnext.org/2018-rhsu-edu-scholar-public-influence-scoring-rubric/

Hess, R. (2015). The RHSU Edu-Scholar Public Influence Scoring Rubric. *Education Week, January 6*. Retrieved from http://blogs.edweek.org/edweek/rick_hess_straight_up/2015/01/rhsu_edu-scholar_public_influence_scoring_rubric.html?r=437497308&preview=1

Hickman, L. (2003). American philosophy of technology: The Empirical Turn (Review). *The Journal of Speculative Philosophy*, *17*(4), 306–308. https://doi.org/10.1353/jsp.2003.0056

Hofmann, B. (2006). When means become ends: Technology producing values. *Media, Technology, & Lifelong Learning*, *2*(2), 1–12.

Howells, C., & Moore, G. (Eds.). (2013). *Critical connections: Vol. 17. Stiegler and Technics*. Edinburgh: Edinburgh University Press. Retrieved from http://www.worldcat.org/oclc/851413574

Iveson, R., & Stiegler, B. (2012). Taking Care with Bernard Stiegler. *Parallax*, *18*(4), 121–125. https://doi.org/10.1080/13534645.2012.715462

James, I. (2012). *The New French Philosophy*. Cambridge, UK, Malden, MA: Polity Press.

Januszewski, A., & Molenda, M. (2008). *Educational technology: A definition with commentary*. New York, NY: Lawrence Erlbaum Associates.

Jones, A., & Bennett, R. (Eds.) 2014. *Dissolving the online-offline divide: Re-conceptualizing space in higher education course design*. Teaching and Learning Forum 2014. Retrieved from http://ctl.curtin.edu.au/events/conferences/tlf/tlf2014/refereed/jones.html

Kant, I. (1979). *The conflict of the faculties: Der Streit der Fakultäten* [Der Streit der Fakultaten]. *Janus series: Vol. 3*. New York, N.Y.: Abaris Books. Retrieved from http://m.friendfeed-media.com/91c8689f09ed3844c1dc69109084f41edf83c836

Kennel, M. (2011). Review of Acting Out by Bernard Stiegler. *Symposium: Canadian Journal of Continental Philosophy*, *15*(2), 248–251. Retrieved from https://www.academia.edu/671628/Review_of_Acting_Out

Kim, J., & Gasman, Marybeth. (2011). In search of a "good college": Decisions and determinations behind Asian American students' college choice. *Journal of College Student Development*, *52*(6), 706–728.

Kirkwood, A., & Price, L. (2013). Missing: Evidence of a scholarly approach to teaching and learning with technology in higher education. *Teaching in Higher Education*, *18*(3), 327–337. https://doi.org/10.1080/13562517.2013.773419

Krippendorff, K. (2004). *Content analysis: An introduction to its methodology* (2nd). Thousand Oaks, Calif: SAGE Publications.

Ladson-Billings, G. (1992). Reading between the Lines and beyond the pages: A culturally relevant approach to literacy teaching. *Theory into Practice*. (4), 312.

Ladson-Billings, G. (1998). Just what is critical race theory and what's it doing in a nice

field like education? *International Journal of Qualitative Studies in Education (QSE)*, *11*(1), 7.

Ladson-Billings, G. (2003a). *Critical Race Theory perspectives on the social studies: The profession, policies, and curriculum*: Information Age Publishing, Incorporated. Retrieved from https://books.google.com/books?id=lPgnDwAAQBAJ

Ladson-Billings, G. (2003b). It's your world, I'm just trying to explain it: Understanding our epistemological and methodological challenges. *Qualitative Inquiry*, *9*(1), 5–12. https://doi.org/10.1177/1077800402239333

Ladson-Billings, G. (2009a). *The Dreamkeepers: Successful teachers of African American children*: Wiley. Retrieved from https://books.google.com/books?id=hhwwRhvsYO0C

Ladson-Billings, G. (2009b). Education for everyday people: Obstacles and opportunities facing the Obama administration. *Harvard Educational Review*, *79*(2), 345–359. https://doi.org/10.17763/haer.79.2.p55341pmq0822713

Ladson-Billings, G. (2013). "Stakes Is high": Educating new century students. *The Journal of Negro Education*. (2), 105. https://doi.org/10.7709/jnegroeducation.82.2.0105

Ladson-Billings, G. (2015). Getting to Sesame Street? Fifty years of federal compensatory education. *RSF: the Russell Sage Foundation Journal of the Social Sciences*, *1*(3), 96–111.

Latour, B. (op. 1992). 'Where Are the missing masses? The sociology of a few mundane artifacts. In W. E. Bijker & J. Law (Eds.), *Shaping technology/building society: Studies in sociotechnical change* (pp. 225–259). Cambridge (Mass.), London (GB):

MIT Press.

Lawson, S. T. (2013). *Nonlinear science and warfare: Chaos, complexity and the U.S. military in the information age*: Taylor & Francis. Retrieved from https://books.google.com/books?id=6003AgAAQBAJ

Lea, M. R. (2013). Reclaiming literacies: Competing textual practices in a digital higher education. *Teaching in Higher Education*, *18*(1), 106–118. https://doi.org/10.1080/13562517.2012.756465

Lemmens, P. (2011). 'This system does not produce pleasure anymore' an interview with Bernard Stiegler. *Krisis*. (1), 33–41.

Lemmens, P. (2014). Bernard Stiegler on agriculture as a technical system. *Sustainable Agriculture Research*, *3*(3), 76–81. https://doi.org/10.5539/sar.v3n3p76

Lemmens, P., & Stiegler, B. (2011). Interview with Bernard Stiegler. *Krisis*. (1), 33–41.

Leonardi, P. M. (2008). Indeterminacy and the discourse of inevitability in international technology, *33*(4), 975–984.

Levin, D. (Ed.) 2012. *Prove IT: What does the research say about technology in education?* CTO Forum Report: Consortium for School Networking (CoSN).

Lievrouw, L. (Ed.). (2006). *New media design and development: Diffusion of innovations v. social shaping of technology*. The Handbook of New Media.

Lloyd, R. (2005). *Mallarmé: The poet and his circle*. Ithaca, N.Y., Bristol: Cornell University Press; University Presses Marketing [distributor].

Luppicini, R. J. (2010). *Technoethics and the evolving knowledge society: Ethical issues in technological design, research, development, and innovation*. Hershey, PA:

Information Science Reference.

Marx, L. (2010). Technology: The emergence of a hazardous concept. *Technology and Culture, 51*(3), 561–577.

McCarty, W. (1997). Technology personified. *Humanist Discussion Group, 11*(252). Retrieved from http://www.digitalhumanities.org/humanist/Archives/Virginia/v11/0236.html

McClelland, M., Geldhof, J., Morrison, F., Gestsdóttir, S., Cameron, C., Bowers, E., . . . Grammer, J. (2018). Self-regulation. in N. Halfon, C. B. Forrest, R. M. Lerner, & E. Faustman (Eds.), *Handbook of life course health development* (pp. 275–298). Cham, Switzerland: Springer. https://doi.org/10.1007/978-3-319-47143-3_12

Miller, S. (1997). Futures work – Recognizing the social determinants of change. *Social Alternatives, 1*(1), 57–58.

Mokyr, J. (2002). *The gifts of Athena: Historical origins of the knowledge economy*. Princeton, [N.J.]: Princeton University Press.

Mokyr, J. (2005). Long-term economic growth and the history of technology. In P. Aghion & S. N. Durlauf (Eds.), *Handbooks in economics: Vol. 22. Handbook of economic growth* (1st ed., Vol. 1, pp. 1113–1180). Amsterdam: Elsevier. https://doi.org/10.1016/S1574-0684(05)01017-8

Oliver, M. (2011). Technological Determinism in Educational technology research: Some alternative ways of thinking about the relationship between learning and technology. *Journal of Computer Assisted Learning*, *27*(5), 373–384. https://doi.org/10.1111/j.1365-2729.2011.00406.x

Oostveen, A.-M. (2007). *Context matters: A Social Informatics perspective on the design*

and implications of large-scale e-government systems. Amsterdam: PrintPartners Ipskamp, Enschede. Retrieved from http://www.social-informatics.net/PROEFSCHRIFT%20OOSTVEEN.pdf

Orwell, G. (ca. 2002). *1984: A novel; Revised and updated bibliography* ([Nachdr.]). New York, NY: Signet.

Pannabecker, J. R. (1991). Technological impacts and determinism in technology education: Alternate Metaphors from Social Constructivism, *3*(1).

Peck, C., Cuban, L., & Kirkpatrick, H. (2002). Techno-Promoter dreams, student realities. *Phi Delta Kappan*, *83*(6), 472–480. https://doi.org/10.1177/003172170208300614

Pfaffenberger, B. (1988). Fetishized objects and humanized nature: Towards an anthropology of technology. *Man*, *23*(2), 236–252. Retrieved from http://www.uio.no/studier/emner/sv/sai/SOSANT1300/h11/Pfaffenberger.pdf

Pharmakon.fr. (2015). School of Philosophy Epineuil-the-Fleuriel [Pharmakon.fr, Ecole de philosophie d'Epineuil-le-Fleuriel]. Retrieved from http://translate.googleusercontent.com/translate_c?depth=1&hl=en&prev=search&rurl=translate.google.com&sl=fr&u=http://pharmakon.fr/wordpress/&usg=ALkJrhhfjnxy9cOe7jeIChdU_GON82kc7A

Plato. (2009). *Protagoras*. Rockville, MD: Serenity Publishers, LLC.

Postman, N. (1992). *Technopoly: The surrender of culture to technology*. Vintage: New York.

Powell III, A. C. (2001). Falling for the gap: Whatever happened to the digital divide? In B. M. Compaine (Ed.), *The digital divide companion: Facing a crisis or creating a*

myth? (pp. 309–314). Cambridge, MA, London: MIT Press.

Preester, H. de. (2010). Postphenomenology, embodiment and technics. *Human Studies, 33*(2-3), 339–345. https://doi.org/10.1007/s10746-010-9144-y

Privateer, P. M. (1999). Academic technology and the future of higher education: Strategic paths taken and not taken. *The Journal of Higher Education, 70*(1), 60–79.

Rahimi, F., & Riasati, M. J. (2011). Critical Discourse Analysis: Scrutinizing ideologically-driven discourses. *International Journal of Humanities and Social Science, 1*(16), 107–112. Retrieved from http://www.ijhssnet.com/journals/Vol_1_No_16_November_2011/13.pdf

Ravitch, D. (1998, March 23). The great technology mania: Forbes.

Ravitch, D. (2000). *The American Reader: Words that moved a nation*: HarperCollins. Retrieved from https://books.google.com/books?id=ZhJQCsOCgGgC

Ravitch, D. (2001). *Left Back: A century of battles over school reform*: Simon & Schuster. Retrieved from https://books.google.com/books?id=xyOxAKKwfDYC

Ravitch, D. (2011). *National standards in American education: A citizen's guide*: Brookings Institution Press. Retrieved from https://books.google.com/books?id=8fk2yE1a0PEC

Ravitch, D. (2013a). Diane Ravitch: 3 dubious uses of technology in schools: Technology can inspire creativity or dehumanize learning. *Scientific American, August 1*. Retrieved from https://www.scientificamerican.com/article/diane-ravitch-3-dubious-uses-technology-in-schools/#

Ravitch, D. (2013b). *Reign of error: The hoax of the privatization movement and the danger to America's public schools* (First edition). New York: Alfred A. Knopf.

Ravitch, D. (2014). Hoaxes in educational policy. *The Teacher Educator*, *49*(3), 153–165. https://doi.org/10.1080/08878730.2014.916959

Ravitch, D. (2016). *The death and life of the great American school system: How testing and choice are undermining education*. New York, NY: Basic Books,.

Ravitch, D. (2017). 5 risks posed by the increasing misuse of technology in schools. *EdSurge News, December 29*. Retrieved from https://www.edsurge.com/news/2017-12-29-5-risks-posed-by-the-increasing-misuse-of-technology-in-schools

Ravitch, D., & Finn Jr., C. (2007). *Beyond the basics: Achieving a liberal education for all children*. Washington, D.C.: Thomas B. Fordham Institute.

Roberts, B. (2007). Introduction to Bernard Stiegler. *Parallax*, *13*(4), 26–28.

Roberts, B. (2012). Technics, individuation, and tertiary memory: Bernard Stiegler's challenge to media theory. *New Formations*, *77*(1), 8–20. https://doi.org/10.3898/NEWF.77.01.2012

Rogers, E. M. (1983). *Diffusion of innovations*. New York, London: Free Press; Collier Macmillan.

Samayoa, A. C., Nguyen, T.-H., Gasman, Marybeth, Commodore, F., & Abiola, U. (2016). Examining the potential of Massive Open Online Courses (MOOCs) at Historically Black Colleges and Universities (HBCUs). *The Journal of Negro Education*, *85*(4), 480. https://doi.org/10.7709/jnegroeducation.85.4.0480

Santangelo, T., & Tomlinson, C. A. (2008). The application of differentiated instruction in postsecondary environments: Benefits, challenges, and future directions. *International Journal of Teaching & Learning in Higher Education*, *20*(3), 307–323.

Schement, J. R. (2001). Of gaps by which democracy we measure. In B. M. Compaine

(Ed.), *The digital divide companion: Facing a crisis or creating a myth?*. Cambridge, MA, London: MIT Press.

Schudde, L., & Goldrick-Rab, S. (2014). On second chances and stratification: How sociologists think about community colleges. *Community College Review*, *43*(1), 27–45. https://doi.org/10.1177/0091552114553296

Sclove, R. (1995). *Democracy and technology*. *The conduct of science series*. New York, London: Guilford Press.

Selwyn, N. (2010). Looking beyond learning: Notes towards the critical study of educational technology. *Journal of Computer Assisted Learning*, *26*(1), 65–73. https://doi.org/10.1111/j.1365-2729.2009.00338.x

Smith, D. (2013). Stiegler and technics. *Parrhesia*, *17*, 92–97. Retrieved from http://www.parrhesiajournal.org/parrhesia17/parrhesia17_smith.pdf

Smith, M., & Marx, L. (1994). *Does technology drive history?: The dilemma of Technological Determinism*. Cambridge, Mass.: MIT Press.

Sousa, D. A., & Tomlinson, C. A. (2011). *Differentiation and the brain: How neuroscience supports the learner-friendly classroom*: Solution Tree Press. Retrieved from https://books.google.com/books?id=WG0XBwAAQBAJ

Stiegler, B. (1998). *Technics and time, 1: The fault of Epimetheus*. Meridian, Stanford, Calif: Stanford University Press. Retrieved from http://www.worldcat.org/oclc/858544607

Stiegler, B. (2003). Our Ailing Educational Institutions. *Culture Machine*, *5*.

Stiegler, B. (2006). Philosophising by Accident. *Public*, *33*, 98–107.

Stiegler, B. (2008, March). *Towards a European way of life*, Chelsea College of Art and Design, London. Retrieved from https://archive.org/details/BernardStieglerLecture

Stiegler, B. (2010). *Taking care of youth and the generations*. Meridian, *Crossing Aesthetics*. Stanford, CA: Stanford University Press.

Stiegler, B. (2011a). *The decadence of industrial democracies*. *Disbelief and discredit*. Cambridge: Polity.

Stiegler, B. (2011b). Distrust and the pharmacology of transformational technologies. In T. B. Zülsdorf (Ed.), *Quantum Engagements: Social Reflections of Nanoscience and Emerging Technologies* (pp. 27–39). Karlsruhe, Germany: Akademische Verlagsgesellschaft AKA GmbH.

Stiegler, B. (2012). Relational ecology and the digital pharmakon. *Culture Machine*, *13*, 1–19.

Stiegler, B. (2014). *States of shock: Stupidity and knowledge in the 21st century* [Etats de Choc. Betise et savoir au XXIe siecle] (English). Malden, MA: Polity Press.

Stiegler, B., Barison, D., Ross, D., & Crogan, P. (2009). *Acting out*. Meridian, *Crossing Aesthetics*. Stanford, Calif: Stanford University Press.

Strobel, J., & Tillberg-Webb, H. (2008). Applying a critical and humanizing framework of instructional technologies to educational practice. In L. Moller, J. B. Huett, & D. M. Harvey (Eds.), *Learning and instructional technologies for the 21st Century: Visions of the future / edited by Leslie Moller, Jason Bond Huett, Douglas M. Harvey* (pp. 1–19). New York, London: Springer. https://doi.org/10.1007/978-0-387-09667-4_5

Strutt, D. (2015). Digital grammatization: The affective synthesis of reality by digital screen media. *Dandelion*, *5*(2), 1–10.

Surry, D., Stefurak, J. R., & Gray, R. M. (Eds.). (2010). *Technology Integration in Higher Education: Social and Organizational Aspects: Social and Organizational Aspects*: Information Science Reference. Retrieved from https://books.google.com/books?id=4j5K4aE9qKIC

Surry, Daniel, Stefurak, J. R., & Kowch, E. G. (2010). Technology in higher education: Asking the right questions. In D. W. Surry, J. R. Stefurak, & R. M. Gray (Eds.), *Technology Integration in Higher Education: Social and Organizational Aspects: Social and Organizational Aspects* (pp. 1–12). Information Science Reference.

Technics and time, 1: The fault of Epimetheus. (1999). *Choice Reviews Online, 36*(05), 36-2700-36-2700. https://doi.org/10.5860/CHOICE.36-2700

Tomlinson, C. A. (2001). *How to differentiate instruction in mixed-ability classrooms*: Association for Supervision and Curriculum Development. Retrieved from https://books.google.com/books?id=A7zI3_Yq-lMC

Tomlinson, C. A. (2009). Intersections between differentiation and literacy instruction: Shared principles worth sharing. *Part of a Special Issue Entitled Teachers as Literacy Leaders: Bringing About Change in Communities*, *45*(1), 28–33.

Tomlinson, C. A. (2013). From gadget to gift. *Part of a Special Issue Entitled Literacy 2.0, 70*(6), 89.

Tomlinson, C. A. (2014). *The differentiated classroom: Responding to the needs of all learners* (2nd ed.). Alexandria: ASCD. Retrieved from http://gbv.eblib.com/patron/FullRecord.aspx?p=1709534

Tomlinson, C. A. (2015). Mobile tech: Great potential, great challenges. *Part of a Special Issue Entitled Literacy 2.0, 72*(8), 86–87.

Tomlinson, C. A. (2017a). *How to differentiate instruction in academically diverse classrooms, Third Edition*: ASCD. Retrieved from https://books.google.com/books?id=rIl2DgAAQBAJ

Tomlinson, C. A. (2017b). Let's celebrate personalization but not too fast. *Part of a Special Issue Entitled Literacy 2.0*, *74*(6), 10.

Tomlinson, C. A., & Allan, S. D. (2011). *Leadership for differentiating schools and classrooms*: Association for Supervision & Curriculum Development. Retrieved from https://books.google.com/books?id=f_ZQBAAAQBAJ

Tomlinson, C. A., Brimijoin, K., & Narvaez, L. (2008). *The differentiated school: making revolutionary changes in teaching and learning*: Association for Supervision and Curriculum Development. Retrieved from https://books.google.com/books?id=cW5PQ7l38lEC

Tomlinson, C. A., & McTighe, J. (2006). *Integrating differentiated instruction & understanding by design: Connecting content and kids*: Association for Supervision and Curriculum Development. Retrieved from https://books.google.com/books?id=OmiaaeNRCX4C

Tsukayama, E., Duckworth, A. L., & Kim, B. (2013). Domain-specific impulsivity in school-age children. *Developmental Science*, *16*(6), 879–893. https://doi.org/10.1111/desc.12067

Turkle, S. (1984). *The second self: Computers and the human spirit / by Sherry Turkle*. New York: Simon and Schuster.

Tyack, D. B., & Cuban, L. (1995). *Tinkering toward utopia*: Harvard University Press. Retrieved from https://books.google.com/books?id=WCQ8TVEP8H8C

Verdenius, W. J. (1985). *A commentary on Hesiod: Works and Days, vv.1-382 / by W.J. Verdenius*. *Mnemosyne. supplementum: Vol. 86*. Leiden: Brill.

Wajcman, J. (1991). *Feminism confronts technology*. University Park Pa.: Pennsylvania State University Press.

Webster, M. D. (2013). Philosophy of technology assumptions in educational technology leadership: Questioning Technological Determinism (Doctor of Philosophy). Northcentral University, Prescott Valley, Arizona.

Wiesemes, R. (2009). *Exploring avenues to interdisciplinary research: From cross- to multi- to interdisciplinarity*: Nottingham University Press. Retrieved from https://books.google.com/books?id=traxAwAAQBAJ&printsec=frontcover#v=onepage&q&f=false

Willoughby, K. W. (2004). Technological semantics and technological practice: Lessons from an Enigmatic Episode in Twentieth-Century Technology Studies. *Knowledge, Technology & Policy*, *17*(3-4), 11–43. https://doi.org/10.1007/s12130-004-1002-7

Wilson, M. (2015). How should we speak about art and technology? *Crossings: Journal of Art and Technology*, *1*. Retrieved from http://crossings.tcd.ie/issues/1.1/Wilson/

Winner, L. (1980). Do artifacts have politics? *Daedalus*, *109*(1), 121–136.

Wyatt, S. (2007). Technological Determinism is dead. In E. J. Hackett, O. Amsterdamska, M. E. Lynch, & J. Wajcman (Eds.), *The handbook of science and technology studies* (3rd ed., pp. 165–180). Cambridge, Mass., London: MIT.

Yang, G. (2009). The internet as a cultural form: Technology and the human condition in China. *Knowledge, Technology, and Policy*, 100–115.

Yeager, D. S., Henderson, M. D., Paunesku, D., Walton, G. M., D'Mello, Sidney, Spitzer,

B. J., & Duckworth, A. L. (2014). Boring but important: A self-transcendent purpose for learning fosters academic self-regulation. *Journal of Personality and Social Psychology*, *107*(4), 559–580. https://doi.org/10.1037/a0037637

APPENDIX A

The Works of Bernard Stiegler in Translation

Stiegler, B. (1993). Questioning Technology and Time. *technema, 1*, 31–44.

Stiegler, B. (1996). Persephone, Oedipus, Epimetheus. *technema*, *3*, 69–112.

Stiegler, B. (1998). Technics and Time, 1: The Fault of Epimetheus. Meridian, Crossing Aesthetics. Stanford, CA: Stanford University Press.

Stiegler, B. (2002). Derrida and technology: fidelity at the limits of deconstruction and the prosthesis of faith. In T. Cohen (Ed.), *Jaques Derrida and the humanities: a critical reader* (pp. 238–270). Cambridge: Cambridge University Press.

Stiegler, B. (2006). Philosophising by Accident. *Public*, *33*, 98–107.

Stiegler, B. (2006). *Spirit, Capitalism, and Superego*. Retrieved from http://arsindustrialis.org/node/2928

Stiegler, B. (2006). *Within the limits of capitalism, economizing means taking care*. Retrieved from http://arsindustrialis.org/node/2922

Stiegler, B. (2007). Anamnesis and Hypomnesis: The Memories of Desire. In *Technicity* (pp. 15–41). Prague: Charles University Press.

Stiegler, B. (2007). Technoscience and reproduction. *Parallax*, *13*(4), 29–45.

Stiegler, B. (2008). *To Take Care*. Retrieved from http://arsindustrialis.org/node/2925

Stiegler, B. (2009). *Acting Out*. *Meridian, Crossing Aesthetics*. Stanford, CA: Stanford University Press.

Stiegler, B. (2009). *Technics and Time, 2: Disorientation*. *Meridian, Crossing Aesthetics*. Stanford, CA: Stanford University Press.

Stiegler, B. (2009). Teleologics of the Snail: The Errant Self Wired to a WiMax Network. *Theory, Culture & Society, 26*(2-3), 33–45.

Stiegler, B. (2009). The Magic Skin; or, The Franco-European Accident of Philosophy after Jacques Derrida. *Qui Parle*, *18*, 97–110.

Stiegler, B. (2009). The Theater of Individuation: Phase-Shift and Resolution in Simondon and Heidegger. *Parrhesia*, *7*(46-57).

Stiegler, B. (2010). *For a New Critique of Political Economy*. Cambridge: Polity.

Stiegler, B. (2010). New Industrial Temporal Objects. In R. Earnshaw & R. Guedj (Eds.), *Frontiers of Human-Centered Computing, Online Communities, and Virtual Environments* (pp. 45–460). London: Springer Verlag.

Stiegler, B. (2010). Taking Care of Youth and the Generations. Meridian, Crossing Aesthetics. Stanford, CA: Stanford University Press.

Stiegler, B. (2010). Technics and Time, 3: Cinematic Time and the Question of Malaise. Stanford: Stanford University Press.

Stiegler, B. (2010). Telecracy against democracy. *Cultural Politics*, *6*(2), 171–180.

Stiegler, B. (2010). The Carnival of the New Screen. In P. Snickars & P. Vonderau (Eds.), *The YouTube Reader* (pp. 40–59). Stockholm: National Library of Sweden.

Stiegler, B. (2010). The Industrial Exteriorisation of Memory. In *Critical Terms for Media Studies* (pp. 64–87). Chicago: University of Chicago Press.

Stiegler, B. (2011). *Desire and Knowledge: The Dead Seize the Living*. Retrieved from http://arsindustrialis.org/desire-and-knowledge-dead-seize-living

Stiegler, B. (2011). Pharmacology of Desire: Drive-based Capitalism and Libidinal Dis-economy. *New Formations*, *72*, 150–161.

Stiegler, B. (2011). The Decadence of Industrial Democracies. Disbelief and Discredit. Cambridge: Polity.

Stiegler, B. (2011). The digital as a bearer of another society. (1), 43–50. Retrieved from http://www.capgemini.com/insights-and-resources/by-publication/digital-transformation-review-no-1-july-2011/

Stiegler, B. (2011). The Pharmacology of Spirit. In J. Elliott & D. Attridge (Eds.), *Theory after 'theory'* (pp. 294–310). London: Routledge.

Stiegler, B. (2011). The Tongue of the Eye: What 'Art History' Means. In J. Khalip & R. Mitchell (Eds.), *Releasing the Image: From Literature to New Media* (pp. 222–236). Stanford, CA: Stanford University Press.

Stiegler, B. (2012). Re-Enchantment of the World: The value of the human spirit vs. industrial populism. London: Continuum.

Stiegler, B. (2012). Relational Ecology and the Digital Pharmakon. *Culture Machine*, *13*. Retrieved from http://www.culturemachine.net/index.php/cm/article/view/464/496

Stiegler, B. (2012). Die Aufklärung in the Age of Philosophical Engineering. Lyon: World Wide Web 2012.

Stiegler, B., & Crogan, P. (2010). Knowledge, Care and Trans-Individuation: An Interview with Bernard Stiegler. *Cultural Politics*, *6*(2), 157–170.

Stiegler, B., Hallward, P., & Gaston, S. (2007). Technics of decision. *Angelaki-Journal of the Theoretical Humanities*, *8*(2), 151–168.

Stiegler, B., & Hubaut, S. (2007). The True Price of Towering Capitalism: Bernard Stiegler Interviewed. *Queen's Quarterly*, *114*, 340–350.

Stiegler, B., & Lemmens, P. (2011). This System Does Not Produce Pleasure Anymore:

An Interview with Bernard Stiegler. *Krisis*, *2011*(1), 33–41.

Stiegler, B., & Neyrac, F. (2012). Interview: From Libidinal Economy to Ecology of Spirit. *Parrhesia*, *14*, 9–15.

Stiegler, B., & O'Gorman, M. (2010). Bernard Stiegler's Pharmacy: A conversation. *Configurations*, *18*(3), 458–476.

Stiegler, B., Venn, C., Boyne, R., Phillips, J., & Bishop, R. (2007). Technics, Media, Teleology: Interview with Bernard Stiegler. *Theory, Culture & Society*, *24*(7-8), 334–341.

APPENDIX B

Ars Industrialis Manifesto 2010

1. In April 2005, when Ars Industrialis was founded, we asserted in our first Manifesto1 that the systematic diversion of desire toward commodities—organized by marketing through the culture industries—and the total submission of the life of the spirit to the imperative of the market economy, "leads, inevitably, to an unprecedented global economic crisis"—during which Capitalism proves to be structurally "self-destructive. "Five years later, the planetary crisis unleashed in 2007 by the collapse of the sub-prime mortgage system continues to spread its calamitous consequences. If the securitisation and financial techniques *diluting responsibility* were the catalyst for the crisis, then it is nonetheless not only financial Capitalism that has become essentially speculative, that is, toxic—because it *systematically plays the short term against the long term*. More generally, and more seriously, it is a crisis of the consumerist model, a model that, based since the beginning of the 20th century on the *instrumentalization of desire* (thought by Edward Bernays, who instrumentalized the theory of the unconscious developed by Freud, who was Bernays' uncle), leads irresistibly to the *destruction* of this desire. What is revealed by this planetary crisis, which marks the end of globalization understood as the planetarization of the consumerist model, is that the destruction of desire through its consumerist exploitation leads inevitably to the ruin of investment in all its forms—and in particular, all the forms of economic, political and social investment which ground the political economy—and there is a systemic link between the drive-based behaviour of the speculator and the equally drive-based behaviour of the consumer.

Disinvestment is the massive consequence of neo-liberal short-termism, the deadly effects of which have been revealed by the crisis of the last three years.

Like the behaviour of the speculator—who is a capitalist who no longer invests—the behaviour of the consumer has become *structurally* drive-based. The consumer's relation to objects of consumption is intrinsically *destructive*: it is founded on disposability, that is, on *disinvestment*. This disinvestment liberates a drive to destruction of which the consequence—insofar as it is the destruction of fidelity to the objects of desire, a fidelity which determines the reality of the investment in objects of desire—is the spread and the systemic and destructive articulation of the drive-based behaviour of consumers as well as speculators, and such that it engenders a kind of *systemic stupidity or beastliness*.[2]

The object of drive-based behaviour that is the object of consumption is structurally disposable and *must* be discarded in order to assure the continuation of the cycles typical of an economy founded on innovation, which was described by Joseph Schumpeter as "creative destruction." The consequence has been that the globalization of the consumerist model has provoked a colossal waste that, as everyone knows, has become unsustainable.

Now, while this *generalized becoming-waste* pollutes the natural environment, the disposability of the object affects the *subjects* who dispose of these objects: they feel that they themselves are disposable. Consumerist society thus proves to have become, today, and in the eyes of everyone, toxic, not only for the physical environment, but also for

mental structures and psychic apparatuses: as drive-based, it has become massively *addictogenic*—and this is why the French national association of stakeholders concerned with toxicology and addiction held its 2009 congress under the banner, "Addictogenic society."[3]

Such is the genuine scope of this crisis, the financial aspects of which are only one element. Now, the greatest and most devastating effect of addiction is that victims of addiction no longer take care of themselves, nor of others, nor of the world around them: they become irresponsible to the point that they can no longer be counted on. Thus, is established a society of carelessness [*incurie*]—that is, a destruction of society, which we have called a dissociation.[4]

It is in such a context that the question of *care*[5] can be posed in a new and political way, not confined to the medical field or the ethical field: *the question of care must go to the heart of political economy*—and with it, clearly, a new cultural, educational, scientific and industrial political culture capable of *taking care of the world*. This is why we propose as an axiom of our reflections that—as the first meaning of the verb "economiser" says, and as at bottom each of us knows—*to economize means first of all and before anything else to take care*.

2. As the last five years have unfolded, Ars Industrialis has refined and added to its initial hypotheses. The principal result of this work has consisted in affirming that the industrial model founded on consumption, which appeared at the beginning of the 20th

century in order to counteract the limits of the productivist model of the 19th century, and which, at the beginning of the 21st century, has taken to its limits the production of negative externalities and all kinds of toxicities (toxic assets, pollution, depletion of resources, destruction of the life of the spirit, attention deficit disorder, pathogenic behaviours of all kinds, intoxication of the body due to over-consumption, the spread of irresponsibility and incivility, corruption, the becoming-mafia of capital, etc.), this model has become obsolete, and it must give way to another industrial model.

We call this new model the *economy of contribution*.[6] This is characterized in the first place by the multiplicity of forms of positive externalities that it engenders.[7] Positive externalities are cares for oneself and for others, taken individually and collectively. This is also a matter of what, in particular since the work of Amartya Sen, are called capabilities.[8]

The economy of contribution—which has been developing for close to twenty years from forms which remain mostly inchoate, indeed embryonic, but which are also at times very advanced: for instance the "open source" economy, which has become the dominant model of the information industry, this industry itself dominating the totality of industry—results from a behavioural transformation induced to a large extent by the deployment of digital networks.

On the internet, it is clear to everyone that there are no longer producers on one side, and consumers on the other: digital technology opens a reticulated space of contributors, *who*

develop and share knowledge, and who form what one calls an *associated milieu*—thereby taking up a concept from Gilbert Simondon.[9] This sharing, which reconstitutes processes of sublimation,[10] and which as such reconstructs a productive economy of desire,[11] of engagement and of individual and collective responsibilities socially articulated *according to new forms of sociability*, opens a space for struggling against dependence, de-sublimation,[12] disgust in oneself and others, and more generally, against speculative intoxication and addiction.

3. Those who observe the practices proliferating on digital networks can however not fail to be struck both by the speed with which they have developed—in particular what have come to be called "social networks"—and by the fact that hyper-consumerist and addictogenic behaviours have developed which frequently turn out to be more violent and mimetic than those springing from the culture industries characteristic of consumerist society.

We maintain that this is so principally for the following reasons:

4.1. As we affirmed in our 2005 *Manifesto*, digital technologies are the contemporary forms of what the Greeks of antiquity called *hypomnemata*, that is, mnemotechnics. Now, these mnemotechnics are also and always what Plato called *pharmaka*, that is, *both poisons and remedies*.

4.2. We propose that in the most general way: 1) all technics is "pharmacological" in the

sense of being potentially harmful or beneficial; 2) lacking a definition of a "therapeutic," or of what the Greeks called a *melete* or an *epimeleia* (discipline, solicitude, care), which presupposes a technique of the self,[13] a *pharmakon* necessarily becomes toxic.

We propose that consequently a politics—that is, in our time necessarily also a political economy—is firstly and above all a system of care which consists in establishing ways of life (and a culture) that know how to deal with a given pharmacological (technical and mnemotechnical) state. A culture is that which cultivates a caring relation to the pharmaka which compose a human world, and which thus struggles against their always possible toxicity.[14]

4.3. For more than two millennia, the establishment of *savoir-vivre*, of the knowledge of how to live, which, in all their forms, constitute systems of care prescribing good uses of *pharmaka*, has been dominated by a privileged relation to *writing* constituting as such the *pharmakon* of reference—whether this was in the form of Scripture [*Écritures*], or as the library of the *Humanities*, then of *Science* in the Republic of Letters, or of the written press forming a public *opinion*. It is on the basis of this alphabetic *pharmakon*, and of its extension with the printing press (and with the Reformation, which fundamentally proceeded from it), that the *savoir-vivre* typical of the West is established—the model of which was diffused through the entire world, in particular through Jesuit Missionaries spiritually preparing the way for the global expansion of industrial markets as well as Western technology.

4.4. Consumerist society was imposed by developing and systematically exploiting the culture industries, which constitute new forms of *hypomnemata* (this is what was understood by Walter Benjamin, unlike his friends in the Frankfurt School). These industrial mnemotechnologies have entered into competition with the alphabetic *hypomnematon*, and these *program industries* (radio and television) have entered into competition with the *program institutions* (schools and universities). This has resulted in a devaluation of the tradition of thinking which was the matrix of Western *savoir-vivre*: that of *logos* and of what we continue to call *reason*, governed by the formal constraints of *theory*. Reason finds itself replaced by *rationalization* (in the sense of Weber, Adorno, Marcuse, and Habermas).

Analogue and electronic *hypomnemata*, monopolized by industrial structures, inaccessible to individual practices, and massively submitted to the opposition between producers and consumers, have not given rise to a re-elaboration of forms of *savoir-vivre*. On the contrary, they have served their destruction, and their replacement by marketing prescriptions through the program industries, weakening the forms that emerged from the epoch of the book and its innumerable institutions structuring forms of knowledge—in particular in democratic and post-revolutionary modernity.

4.5. Digital *hypomnemata* appear at the end of the 20th century making it possible to surpass this situation. But like every *hypomnematon*, this is firstly a *pharmakon*: it requires the invention, institution and transmission of practices of care which are also techniques of the self and others, as recalled by Michel Foucault.[15] Now, marketing, a principal function in the economy of a consumerist society, has immediately seized hold

of these *hypomnemata*, which are also *relational technologies*, with an extreme power, and through which brands try to perpetuate and even intensify and increase the toxic behavioural models typical of consumerism, at the very moment when the culture industries which have been historical vectors are entering into decline—the socialization of digital technologies being thus undertaken *essentially from the poisonous and drive-based side* of this *pharmakon*.

4.6. Since the "conservative revolution" imposed throughout the world by Great Britain and the United States through Margaret Thatcher and Ronald Reagan, public power has renounced intervening in economic and industrial life and renounced regulating the speculative tendency of capital. This means that it has totally failed to assume what is its role *par excellence*, namely: encouraging the development of what, in technics in general, and in mnemotechnics in particular, leads to the reinforcement of society—to *make of technical becoming a social future* intensifying processes of individuation by *inventing forms of life, that is, of savoir-vivre*—and thus to struggle against the destructive, atomising and uncivil effects which every *pharmakon* also and always brings with it.

4.7. This renunciation, this failure by the public power to exercise its function, leads to a situation of *carelessness [*incurie*] at once economic and political* such that, if there is no rapid change, in a context which at times borders on global panic, it will without doubt lead to political catastrophes of unknown violence, and on a planetary scale.
The stakes here are no longer the risk of a major and planetary economic crisis—which has already happened—but of a politico-militaro-ecological catastrophe the probability of

which becomes each day more threatening. The public power, ideologically conditioned and weakened by the neo-liberal dogma which poses in principle that this power should be replaced by marketing, avoids its responsibilities and allows itself to be instrumentalized by economic powers coming from the 20th century, which develop consumerism, which still make enormous profits from it, and *which struggle ferociously to prevent this model from changing* even though it has become self-destructive—*themselves thus being blindly self-destructive*.

Faced with this carelessness which could become fatal, political forces must clearly take a position.

4. Today, in 2010, from out of the lessons of the crisis, but also from out of new practices which developed well before this crisis, and against that which caused this crisis, it is possible to *reconstitute a political project as bearer of a new affirmation of the role of public power*, namely: to make a technical *becoming* into a social *future*.

5. We maintain that this new politics must place at the heart of its action support for a new industrial model which is already emerging through nascent forms of the economy of contribution.

We are aware, however, that the consumerist model remains in our time and more than ever not only dominant, but strictly hegemonic. Hegemony is always achieved (it reaches its *optimum*) at the very moment that it encounters its own limit: it is at the moment that it

is most powerful that it is also closest to collapse; it is through the *excess* in which it consists that it is led to its own ruin.

Nevertheless, if this collapse has already begun, we are aware that economic and political responsibility consists firstly, still today, in "keeping the wheels turning" and "filling the breadbasket," that is, in one way or another, in making this hegemony last. But we also know, as does everyone, that this way of doing things cannot last: we know that this situation cannot last *in the long term*.

We accordingly propose that today, more than ever, genuine political action—not as the search for power for itself, but as the implementation of a *new political and economic knowledge*—consists in *guaranteeing the short term* in order to *reach the long term* which consists precisely not only in overcoming the short term, but in *reversing* its dominant characteristics.

Each of us are affected by this contradiction of being at the same time in some way a consumer, and a citizen conscious that the consumerist modality of consumption has become toxic—and contradictory to the most elementary obligations of citizenship. *Each of us* is confronted with the *feeling* of a new individual and collective responsibility, and with the *reality* that one's own behaviour is in some way always irresponsible. *Each of us*—whatever our denials or blindnesses may be—has more or less become a consumer who is both dependent and miserable.

Each of us on the other hand need not only for the economy not to collapse, but to develop—and in particular, this is so for the *250 babies* who, in 2010, are born *every minute*, that is, *350 000 every day*, close to *one hundred million per year*.

We and our fellows are dependent on the consumerist economy even as we fight against it and suffer from it. Nevertheless, we know that it cannot last because, as an organization of an innovation founded on disposability, waste, carelessness, and blindness, it is in contradiction with the future—and threatens the future of the hundred million babies born each year.

By entrusting to marketing the concrete expression of techno-economic becoming, neo-liberalism has liberated a blind power which destroys the future and dangerously demoralizes the youngest generations at the same time that it objectively threatens them. Such is the genuine stake of the crisis.

Because now *each of us knows*, more or less intuitively, *that it has nevertheless become possible to convince the populations of industrial countries to project*, through a critical path negotiated, debated, not monopolized by lobby groups and contractualized on time scales accommodating short term constraints over long term perspectives, *a new industrial economy founded on care*—where this is clearly not merely a matter of adapting the obsolete model to a "green" consumerism: it is a matter of *inventing a new savoir-vivre*. And this presupposes radically new political, economic and industrial thinking and propositions.

Industrial and collective, scientific and civic, political and economic, responsibility is to project the conditions for a passage from a system which was founded on "disapprenticeship," that is, the destruction of savoir-faire, the destruction of savoir-vivre, and the systematic destruction of theoretical and critical knowledge itself, that is, founded on a systemic stupidity (this is what the Madoff affair signifies), to a system founded on the development [le développement et la mise en valeur] of all types of capabilities, that is, of all forms of knowledge (savoir-faire, savoir-vivre, theoretical knowledge).

Faced with the unheard of possibilities opened up by digitalisation, the whole world proclaims, through names such as the "knowledge society" or the "knowledge economy," the advent of a new age. But the digital, which is a *pharmakon*, can increase generalized proletarianization as well as bring it to an end. Such is the political and economic problem around which the future of the world is being played out—in an epoch in which one digital "social network," *Facebook*, has become the third largest global collection of human individuals with 500 million members as of July 2010.

6. We call *proletarianization* the process through which an individual or collective knowledge, being formalized through a technique, a machine, or an apparatus, can escape the individual—who thus *loses* this knowledge which was until then *his* knowledge. The first definitions of proletarianization, emerging from the analyses of Smith as well as Marx, made clear that pauperisation results in the first place from the loss of *savoir-faire* of workers enslaved to machines, and no longer masters of their tools (craftsmen).

In the 20th century, it was consumers who lost their *savoir-vivre*—replaced by *apparatus,* such as the television set, which kept children "occupied," and by *services,* such as the television network, which kept children "occupied" through the apparatus for televisual reception, but in such a way as to create "available brain time." This loss led to a deprivation of recognition, sociability, and finally existence, generating the suffering of the consumer become miserable.

But the intellectual workers of "cognitive capitalism," the functions of which are increasingly confined within the parameters of information systems the principles of which they are unable to modify—frequently because they are unaware of them—are subjected as well to a *proletarianization of higher cognitive functions* where *what is lost is that which constitutes the life of the spirit as a critical, that is, rational, authority, capable of theoretical self-formalizing* and as such of being *self-critical*.

Alan Greenspan's statement to the House of Representatives is in this regard eloquent: he acknowledged that he had no theoretical knowledge of the financial functioning that he was supposed to administer—while in this same period Bernard Madoff was the chairman of NASDAQ.

What caused the success of the contributive model emerging with digital networks—however limited this may be given that the old system, which still has innumerable privileges to defend, making for a merciless war, and this is especially so for that

movement, at once economic, technological, juridical, political, social and cultural, emerging from free software—*is that it breaks with the situation of generalized proletarianization that has been imposed by consumerism on all social actors*, regardless of where they may have come from.

This rupture is not a rejection of new technical possibilities. On the contrary: it aims to socialize these possibilities, that is, to place them into the service of society, rather than at the service of a destructive "innovation" founded on disposability, and on the social regression in which it inevitably results. Instead, it is founded on a social innovation which cultivates that which, in the evolution of the science and technology that it socializes and concretises, enables taking care of the world and of its future.

That *hypomnemata* are, as *pharmaka*, remedies as well as poisons, means that *in our current epoch* electronic technologies, monopolized until now by the economic powers emerging from the 20th century as psychotechnologies[16] at the service of behavioural control, must become nootechnologies, that is, technologies *of spirit*, at the service of de-proletarianization and of the reconstitution of *savoir-faire, savoir-vivre* and theoretical knowledge.

De-proletarianization, which is a re-conquering of responsibility, must be placed at the summit of political and economic goals to be promoted and realized in the years to come. The exemplary character of the battles waged by free software activists lies in the fact that, for the first time, workers from the industrial world are inventing a new organization

of work and of the economy that makes de-proletarianization its principle and its *credo*.

7. This model can be generalized. It does not only concern the digital world—even if it always requires digital infrastructure[17] insofar as this reconstitutes an industrial and technogeographical associated milieu.[18] Implementing technologies that operate on the timescale of the speed of light as such constitutes a "light time" which must come to replace the carbon time of the 20th century (which includes the production of photovoltaic energy), the reticular structure of this infrastructure is no longer based on a centralized organization controlling a periphery and keeping in a reduced position, but rather on a grid of servers forming spaces of contribution reinventing the isonomy and autonomy which constitute the foundations of Greek citizenship, and which also participate, in our epoch, and in this new contest, in economic life.

The transmitter, the centralized power station, the central buying office, all give way to servers, to "smart grids" and to cooperative, contributive and collaborative arrangements, such as AMAP (*Association pour le maintien d'une agriculture paysanne*). With smart grids, renewable energy becomes possible, but it is also the case that there are no longer energy producers on one side, and consumers on the other: the smart grid constitutes a distributed, shared and plastic production capacity.[19] But it is also the cooperative, collaborative and contributive organization of businesses and within businesses, and in the relation of businesses to those who become their contributors rather than merely their customers, which is being played out—according to cooperative models which of course remain to be defined and encouraged, but the ethics of which (in Max Weber's sense) is

that of care understood as political economy.

In this reticular society, where all manner of relational technologies proliferate, the pharmacology of technologies of spirit—such that they aim to create from digital networks new capacities for individuation, new processes of "capacitation" (to speak in terms inspired by Sen), and such that they struggle against these networks being placed into the service of a hyper-consumerism that, more than ever, remains toxic and addictive, and destructive of sociability—becomes a priority for local and territorial (i.e., regional) collectivities.

8. Relational ecology in fact constitutes the stake of what promises to be the age of a new territoriality—given that relational technologies are territorializable and localizable in all aspects, able to be accessed and introduced through local servers, but are equally geo-referenced and geo-localized through a planetary address system spreading the use of the GPS standard via intermediaries such as cars and mobile phones, and via the kind of metadata that has made "Google Earth" possible. This capacity for re-localization combines with the *post-consumerism* in which the economy of contribution consists in order to open an era of what must be understood as a *post-globalization*.

The end of consumerism is the end of globalization insofar as it has essentially consisted in short-circuiting and in the end literally *dis-integrates* territories. Relational and reticular technologies, however much they may be the object of a territorial, national and international political appropriation, on the contrary constitute technologies of re-

territorialization. The territory is a space of positive and negative externalities that its inhabitants know—and which is an irreplaceable knowledge. The territory is as such the privileged terrain for political de-proletarianization—for struggling against the proletarianization of the citizen who has become exclusively a consumer, a fact that is systematically reinforced by political marketing which supplies us with ever more mediocre electoral products.

Post-globalization is not a territorial withdrawal: it is on the contrary the inscription of territory in a planetary reticularity through which it can be augmented with its partners at all the levels of which it is composed, from the interpersonal relation made possible by the opening up of rural regions implementing a politics of the digital age, to business which, deploying its competence locally and contributively, knows how to build a de-territorialized relational space: ecological relational space is a territory of hyper-learning—and here we also refer to the analyses of Pierre Veltz.[20]

9. Such a policy of *digital territories* must, however, be supported by a national policy, which must in particular, beyond a national policy *of* territories but rather *with* territories—and not in order to establish a competition between them, as neo-liberal dogma imposes in an irresponsible way—announce:

9.1. A scientific, technological and industrial policy favouring the coherence of the new digital technical system in the sense of a new industrial model, and resolutely

breaking, but still in a reasoned and reasonable way (supportable by the short and medium term constraints of the economy), with the obsolete model.[21]

9.2. An education, school and university policy, which takes full advantage of the new forms of *hypomnemata* for a teaching not in order to proletarianize citizens still further, as certain projects for the digitalisation of school work may give a thousand reasons to fear, but rather in order to directly rearrange the knowledge accumulated through writing with the new forms of writing that are the digital *hypomnemata*—new forms of *pharmaka* and therefore of poisons, to which the "digital natives," but also their parents and teachers, are today most of the time simply abandoned, on a market which appropriates them without limitation, for lack of any public policy.[22]

9.3. A fiscal policy, both national and territorial, which favours the flourishing of the productive activity of positive externalities in direct relation to a policy of work-time, of new forms of work and of the organization of work, and such that this is completely distinct from simply "employment."[23]

9.4. A cultural policy which makes of culture a social investment, a fundamental element of de-proletarianization and a permanent construction site for the "capacitation" of individuals and, through them, of territories themselves—culture understood as capacitation being always also the invention of new forms of care, of techniques of the self and of the "we," that is, of *savoir-vivre*.

9.5. A health policy concerning the toxicity of psychotechnologies and concerning relational ecology, confronting the question of non-drug addictions, and which must be understood from a pharmacological perspective in the sense emerging from Plato (rather than in the sense of the pharmaceutical industry): in the sense that a poison is frequently also the only cure[24] inasmuch as within it is proposed a therapeutic based on care understood in a much larger sense, as culture and as education.

9.6. A new media policy, which draws consequences from the ruinous by-product of their having been put at the service of an industrial populism itself induced by the drive-based becoming of consumerism, and which restores to the print media and to the program industries, in particular insofar as digitalisation enables them to evolve in radical ways—and obliges them to do so—a functional and fundamental role in the formation of public space as struggle against carelessness [*incurie*], against the destruction of attention, generalized proletarianization and the liquidation of all forms of responsibility.[25]

10. We will go further into these themes and bind them more tightly together, as we have already begun to do through the investigations systematically undertaken over the last five years. We shall do so, at the same time, by:

- Developing work groups according to the model already implemented around "techniques of the self";

- Implementing contributive technologies with our subscribers—something we have already begun to make a concrete reality thanks to the aid of the Conseil Régional d'Ile de France, and with the *Lignes de temps* software;
- Working directly with territories (as we already do with Nantes Métropole and the Conseil Régional du Nord-Pas-de-Calais);
- Developing research activities according to a model similar to that which the Frankfurt School tried to undertake at the beginning of the 20th century, first in Germany and then in the United States.