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Iranian Teachers' Philosophy of Technology: a Stieglerian transcendental critique

Ali Vahdati Daneshmand¹ | Mohammad Amiri²

1. Corresponding Author, Assistant Professor, Department of Philosophical and Social Foundations of Education, University of Tehran, Tehran, Iran. E-mail: alivahdati@ut.ac.ir
2. MA in History and Philosophy of Education, Department of Education, Shahed University, Tehran, Iran. E-mail: amiri1379mohammad@gmail.com

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ABSTRACT

The accelerated integration of digital technologies into education has renewed longstanding philosophical debates concerning the nature, role, and consequences of technology in schooling. While international scholarship has increasingly emphasized the importance of interrogating the philosophical assumptions underpinning teachers' engagement with technology, little work has examined such orientations in the Iranian context. This qualitative study explores Iranian secondary school teachers' implicit philosophies of educational technology and critically evaluates them through the conceptual frameworks of Andrew Feenberg's philosophy of technology and Bernard Stiegler's pharmacological perspective. Drawing on semi-structured interviews with twelve teachers and employing a hybrid deductive-inductive thematic analysis, this study identifies four *Philosophical-Pedagogical Themes in Educational Technology* (PPTET), each of which is revealed through the binary logic inherent in the pharmacological integration of technology in education. Through a Stieglerian reading, such dualisms are shown to obscure the constitutive and ambivalent nature of technological mediation in processes of teaching, learning, and individuation. The findings reveal a need to move beyond access-oriented and utilitarian narratives toward cultivating critical digital judgment and fostering pedagogical practices grounded in care, attention, and reflective technological engagement.

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Intruduction

The integration of technology into education has long been a subject of scholarly attention, praised for its potential to enhance teaching and learning across diverse disciplines (Christopoulos & Sprangers, 2021). Research indicates that access to appropriate digital tools significantly impacts students' cognitive, emotional, and social development, while also fostering engagement and motivation in the classroom (Gonzalez-Mohino et al., 2023). However, despite these advantages, the adoption of technology in education has often fallen short of its transformative promise. Ertmer (1999) highlights two key barriers to achieving this transformation: external (first-order) and internal (second-order). While first-order barriers, such as a lack of funding, insufficient access to equipment, and inadequate technical support, are more tangible and often easier to address, second-order barriers—rooted in teachers' beliefs, attitudes, and understanding of technology—pose a more complex challenge. In this context, it becomes crucial to examine teachers' philosophical perspectives on technology as second-order factors that may hinder or facilitate the effective integration of technology in educational settings. These internal barriers influence how educators perceive the role of technology in teaching and learning, shape their willingness to embrace it, and ultimately determine how effectively they integrate it into their pedagogical practices.

In the Iran education system, numerous formal efforts have been made over the past three decades to implement and utilize educational technologies and information and communication technologies (ICT) in schools. The most prominent of these initiatives was the Smart Schools Project in Iran. However, similar to previous analyses of barriers to the success of such initiatives, this project also faced both external and internal challenges. As Seraji et. al. (2020, 4226) points out, one of these internal factors relates to the inherent nature of information and communication technologies stating that “technology should not be considered a panacea for educational problems”. They posit that teachers' perspectives on the nature of educational technologies are inherently tied to how they philosophically reflect on technology.

Moreover, we are currently living in an era where the proliferation of AI-based educational technologies has once again brought us face-to-face with fundamental questions about technology. Thus, it is imperative, before either hastily embracing these technologies or rejecting them based on technophobic perspectives, to revisit these internal and philosophical dimensions, particularly as they pertain to teachers—who remain the most crucial agents of transforming education.

In the literature, two main branches of research can be identified. The first, comprises studies that aim to establish the foundational groundwork for emphasizing the importance of addressing the philosophy of technology in educational technologies setting the scene for other more practical studies (see e.g. An & Oliver, 2021; Peters, 2006). The second, builds upon the efforts

of the first, conducting research on teachers' philosophical mindsets regarding technology (see e.g. [Chen, 2011](#); [Kruger-Ross, 2013](#)).

In studies related to Iran's educational system, there are also examples that fall within the first branch of research. For instance, [Bagheri Noaparast \(2002\)](#), [Zarghami-Hamrah et al. \(2007\)](#), [Mehrmohammadi \(2013\)](#), and [Sajjadi \(2019\)](#) have emphasized the necessity of adopting a philosophical stance toward technology when approaching educational technologies within Iran's educational framework. However, no research has specifically addressed the philosophical perspectives of Iranian teachers on technology. The present study aims to fill this gap in the existing body of literature.

In pursuing this objective, we adopt both descriptive and critical approaches to teachers' perspectives. First, through a qualitative study, we aim to describe the fundamental viewpoints of teachers regarding technology. In the second step, drawing on Bernard Stiegler's philosophy of technology—an approach that transcends ([Stiegler, 2018](#)) conventional classifications within the philosophy of technology—we seek to critique the current state of affairs and propose alternative recommendations. Thus, we aim to address two fundamental questions: 1) What is the implicit philosophy of technology of teachers in Iran? 2) What insights does Bernard Stiegler's transcendental philosophy of technology provide regarding Iranian teachers' philosophy of technology?

Theoretical framework

Various classifications of philosophical orientations toward technology have been proposed thus far ([Carpenter, 1992](#); [Dusek, 2006](#)). However, in this study, we utilize Feenberg's fourfold typology to explore teachers' philosophical perspectives on technology ([Feenberg, 1999](#); [Feenberg, 2009](#)). Feenberg frames the inquiry into technology around two central axes:

1. **The autonomy versus humanly control in technological advancement:** Does technology dictate its own subsequent developments, requiring humans to adapt to the rules of this progression, or are humans the primary agents, determining the course of technological evolution at every stage?
2. **The neutrality versus value-ladenness of technology:** Does technology, as promoted during the Enlightenment, exist as a neutral and value-free entity, or is it, as the ancient Greeks believed, inherently imbued with values? In other words, is there an intrinsic gap between tools and their purposes, or do the tools themselves shape and direct the purposes they serve?

The intersection of these two axes, each with two positions, gives rise to four fundamental perspectives on technology, as illustrated in the table below. According to four boxes at the intersection of these two axes, in *Instrumentalism*, “the isolated and independent mind approaches and utilizes a world of objects that is fundamentally external to it” ([Oraldi, 2023](#),

67). This perspective is rooted in instrumental rationality, which refers to the logic of means and ends. It involves identifying and employing the most efficient methods to achieve a predetermined end without evaluating the ends themselves (Dusek, 2006, 7).

But in Determinism, “technology causes or determines the structure of the rest of society and culture. Autonomous technology is the claim that technology is not in human control, that it develops with a logic of its own” (Dusek, 2006, 84).

[Technological determinism] is the view so widely held in social science since Marx that the driving force of history is technological advance. Determinists believe that technology is not humanly controlled, but that on the contrary it controls humans, that is, it shapes society to the requirements of efficiency and progress (Feenberg, 2009, 6).

Substantivism, rooted in Heideggerian thought, asserts that technologies not only embody the value of efficiency but also actively shape and dictate a distinct way of life. While *Determinism* and *Instrumentalism* regard efficiency as the sole formal value that distinguishes successful technological initiatives from failures, substantivism further posits that technology, as an entity, carries intrinsic values and serves as a means for the pursuit of power and the exertion of control over human and society.

The critical theory of technology, within which Feenberg situates his perspective, lies at the intersection of two distinct views on technology. On the one hand, it aligns with the essentialist perspective, which asserts that technology is inherently value-laden. On the other hand, it shares common ground with the instrumentalist view in its recognition of the possibility of exercising control over certain aspects of technology and implementing modifications to it. As Feenberg observes:

Critical theory of technology holds that human beings need not await a God to change their technological society into a better place to live. Critical theory recognizes the catastrophic consequences of technological development highlighted by substantivism but still sees a promise of greater freedom in technology. The problem is not with technology as such but with our failure so far to devise appropriate institutions for exercising human control over it. We could tame technology by submitting it to a more democratic process of design and development (Feenberg, 2009, 9).

Although Feenberg’s proposed framework serves as the primary theoretical reference in this study for designing interviews and dialogues with teachers, as well as for analyzing the resulting data, we argue that Bernard Stiegler’s perspective—with its transcendental elements (Ihde, 2008; Verbeek, 2005)—offers broader insights into teachers’ implicit philosophies of technology. Stiegler shares certain affinities with Feenberg (Delanty & Harris, 2021) but

“Stiegler aims at something altogether bigger, wilder and more excitingly political” (Smith, 2021, 47).

Technology is:	Autonomous	Humanly Controlled
Neutral (complete separation of means and ends)	Determinism (e.g. traditional Marxism)	Instrumentalism (liberal faith in progress)
Value-laden (means form a way of life that includes ends)	Substantivism (means and ends linked in systems)	Critical Theory (choice of alternative means-ends systems)

Figure 1: A Taxonomy of Philosophies of Technology, Source: Feenberg (1999)

Method

Study design

Given that the primary aim of this study is to examine teachers' perspectives, it is situated within the interpretive paradigm. Accordingly, to answer first question, a qualitative research design was employed to enable in-depth exploration and focused engagement with participants' viewpoints. In order to bridge the theoretical lens of the researcher with teachers' reflective philosophies of technology, both deductive and inductive approaches were applied concurrently (Kennedy & Thornberg, 2018).

The deductive component, informed by Feenberg's framework shaped the formulation of interview questions and guided the initial phase of analysis. Feenberg's conceptual model served as a sensitizing framework for identifying relevant themes; however, no pre-existing codes were directly imposed on the interview transcripts. Instead, the initial descriptive coding drew on the conceptual orientation provided by Feenberg's categories while remaining open to novel meanings emerging from the data.

Simultaneously, inductive coding allowed for the emergence of additional categories grounded in the teachers' own expressions and narratives. This iterative process involved

refining codes, revisiting category boundaries, and integrating new insights as the analysis progressed. Deductive and inductive elements were thus interwoven throughout the coding process, ensuring that the analytical framework both reflected established theoretical concepts and captured the unique, context-specific perspectives articulated by participants.

In response to the second research question, we draw upon the method of *ampliative criticism* proposed by Haggerson (Haggerson, 1991). This form of critical inquiry seeks to uncover the taken-for-granted norms and assumptions embedded within various dimensions of education. Such critique does not emerge from a hyperrational standpoint; rather, it arises from within the very shortcomings and limitations inherent in current educational practices.

Participants

The study was based on interviews with twelve Iranian secondary school teachers, comprising eight men and four women. All participants were teaching in public schools at the time of the interviews and were former colleagues of the first author of this research. Their educational qualifications ranged from bachelor's to doctoral degrees, and all had completed at least one degree in a field related to educational sciences. The participants' average age was 41 years, with teaching experience ranging from 5 to 28 years.

To ensure variation in perspectives, the sample included teachers with experience in both urban and rural schools. Subject areas were purposefully selected to include disciplines in which multiple factors—such as in-textbook activities, the learning needs of students, and the availability and relevance of learning technologies—had led teachers to devote a substantial portion of their instruction to the use of educational technologies. Consequently, three subject domains were chosen: mathematics, Science, and vocational technology.

Elementary school teachers were excluded from the study because the technological infrastructure in Iranian public primary schools remains underdeveloped. Furthermore, national documents for educational policymaking at this level place greater emphasis on direct human interaction with minimal technological mediation, particularly during the early years of schooling. Teachers from the private sector were also excluded, as the absence of consistent hiring criteria and supervision in private schools means they cannot be considered representative of the broader teaching community.

Within the interpretive qualitative paradigm adopted in this study, prior familiarity also provided important methodological advantages. Because the study sought to explore teachers' *philosophical orientations* toward technology—an introspective and often personally meaningful domain—establishing trust and openness was crucial for eliciting reflective and candid accounts. In the Iranian educational context, such depth of dialogue would have been far more difficult to achieve with unfamiliar participants. Moreover, in line with Tracy's (2010) criteria for *rich rigor*, we sought to ensure that the complexity of our data, sampling choices,

and analytic procedures was commensurate with the complexity of the phenomenon under investigation.

However, several measures were taken to minimize potential bias. First, participants were explicitly assured of confidentiality and reminded that there were no “correct” or “expected” answers, and that their views—whether critical, ambivalent, or affirmative—were valuable for the study. Second, the semi-structured interview protocol relied on broad, open-ended questions designed to avoid leading participants toward particular positions. Third, during the interviews, participants were encouraged to articulate disagreements, uncertainties, or counter-mainstream views; several did, suggesting that social desirability bias did not dominate their responses. Finally, in the analysis process, the combination of deductive and inductive coding, accompanied by iterative memoing, helped ensure that themes emerged systematically rather than being influenced by prior familiarity.

Data collection

The research data were gathered through individual semi-structured in-depth interviews. First, an online meeting was scheduled with each participant via Google Meet. The interviews followed an interview guide consisting of pre-designed main questions as well as supplementary prompts. The main questions focused on the participants' experiences and philosophical perspectives on educational technology (e.g., *What role do you think educational technologies should play in your subject area? How do you perceive the relationship between technology and the learning process? What challenges have you encountered in integrating technology into your teaching?*). Additional questions addressed contextual and institutional factors (e.g., *How is technology used in your school? What resources or support do you need to improve technology use in your teaching?*) along with background information (e.g., educational qualifications, teaching experience, professional development).

Participants were encouraged to elaborate freely and extensively on their views, without adhering to conventional constraints, to allow for richer and more nuanced responses. All interviews were recorded with the participants' consent, conducted in Persian, and transcribed verbatim to preserve their original meaning. The transcripts were then returned to each participant for clarification and confirmation of the ideas discussed.

Throughout the research process, ethical principles were followed. Participants were informed about the purpose of the study, their right to consent or withdraw at any point, the anonymity of their contributions, and the fact that the data would be used solely for research purposes.

Data analysis

The interviews were transcribed and subsequently analysed, coded, and categorised. All stages of the analysis were conducted in Persian. The method of analysis was qualitative and

hermeneutic, following the six-step thematic analysis procedure described by Braun and Clarke¹ (2006). The thematic analysis was guided by Feenberg's (1999) classification of philosophical orientations toward technology, which served as the primary theoretical framework to address the research question. However, as they emphasize in their later works (Braun & Clarke, 2019), it is essential to apply these phases with greater flexibility and to acknowledge a more significant role for the researcher in conceptualization. This more reflective approach "is not about following procedures 'correctly' (nor about achieving 'accurate' and 'reliable' coding or reaching consensus between coders), but rather about the researcher's reflective and thoughtful engagement with their data and their reflexive and considered involvement in the analytic process" (Braun & Clarke, 2019, 594). This process involved reading and rereading the data to establish familiarity, making initial notes on evident topics, and analyzing patterns across these topics to identify emerging themes. The coding process was iterative and comparative, involving the continuous interplay between inducted themes, theoretical perspectives from the literature, and participants' viewpoints.

The first two steps were (1) familiarisation with the data, which entailed repeated reading of the full dataset, and (2) generating initial codes by labelling any text segments that addressed the research question. These initial steps were conducted inductively, allowing comprehensive patterns to emerge from the participants' narratives without being constrained by pre-existing categories.

Considering this flexible approach to thematic analysis, in the initial stage—here referred to as *preliminary coding*—we read the interview transcripts sentence by sentence. Whenever we encountered words or concepts used by the teachers that, in our view, warranted philosophical scrutiny, we noted them down. In the subsequent *secondary coding* phase, we sought to categorise these concepts based on our prior knowledge of the philosophy of technology as *Philosophical–Pedagogical Themes in Educational Technology* (PPTET). As additional philosophical themes emerged, we employed analytic memos to explore their meaning and implications. While the specific *content* of the PPTETs emerged inductively from the data, the decision to organize these themes as *dichotomous polarities* was a deductive analytical choice informed by Feenberg's theoretical topology.

The third step (3) involved generating themes. At this stage, the codes were sorted into a hierarchical structure, and themes were generated deductively in light of Feenberg's framework, as its theoretical concepts offered a clear connection to the focus on teachers' philosophical orientations toward technology. For example, themes reflecting instrumentalist, substantive, critical, and democratic perspectives on technology were identified as particularly significant.

¹ We acknowledge that the structure of this section has been inspired by the methodological approach adopted in Nordlöf, C., Hallström, J., & Höst, G. E., (2019).

The fourth step (4), reviewing themes, involved revising and refining thematic categories to reduce overlap and ensure that each theme captured a distinct dimension of teachers' philosophical stances. The fifth step (5) was to define themes and sub-themes, with attention to their correspondence to specific orientations in Feenberg's classification as well as to emergent categories that lay outside the initial theoretical framework.

Finally, in step (6), representative excerpts were extracted to illustrate each theme. The process was iterative throughout, involving movement between inductive exploration of the interview material and deductive engagement with Feenberg's conceptual distinctions, to ensure both theoretical coherence and sensitivity to participants' unique expressions of their philosophy of technology.

Findings

The thematic analysis identified four central Philosophical-Pedagogical Themes in Educational Technology (PPTET). In alignment with Feenberg's framework, these are presented below as dichotomous spectrums. However, it is crucial to note that these polarities serve as heuristic devices to map the philosophical terrain rather than rigid classifications of the teachers themselves. As the data will show, participants often occupied fluid positions, oscillating between these poles depending on the specific context of their classroom experience or the specific technology being discussed. The following themes represent the tensions navigated by the teachers rather than fixed identities.

PPTET 1: Pedagogy Determination vs Technology Determination

Among the interviewees, some emphasized the primacy of educational goals and pedagogical planning in the adoption of educational technologies, asserting that technology should be integrated only insofar as it aligns with pedagogical objectives (n=8). For example, Teacher 1 states:

In the classroom, technology functions as a neutral tool. It is the teachers and educational administrators who decide how to utilize it.

Or, as Teacher 6 puts it:

My experience has shown that when used correctly, technology can enhance educational processes. However, its improper use can lead to increased pressure and stress in the learning environment.

Others (n=4), however, perceived the development and expansion of educational technologies as far too pervasive and powerful to be fully controlled by teachers, suggesting that technology itself plays a deterministic role in shaping educational practices. For instance, Teacher 4 states:

Changing technology is nearly impossible. Like a powerful force, technology not only influences ways of life but also reshapes societal values and norms in such a way that any attempt at modification or revision faces resistance.

Reflecting Feenberg's classification, these narratives reveal a tension between advocacy for human control and a resignation to the autonomy of technology. While some participants predominantly articulated the former, their narratives often betrayed an underlying anxiety regarding the latter.

PPTET 2: Education by Technology vs Education with Technology

Considering that education is inherently intertwined with values, once we acknowledge the value-laden nature of technology, we can begin to speak of an education that is specifically shaped by the application of technology in educational contexts (education *by* technology). In this light, educational technology is not merely a tool for achieving pre-established pedagogical objectives; it becomes a dynamic force that actively participates in the formulation of educational practices and values. In this regard, it is clear that if we consider technology as an inherently neutral entity, then it becomes easy to speak of embedding technology within education (education *with* technology). This perspective assumes that technology can be seamlessly integrated into the educational process without altering its intrinsic values or objectives, portraying it as a mere instrument to facilitate the transmission of knowledge and the achievement of pedagogical goals.

Most of the interviewees (n=11) referred to the unforeseen educational consequences resulting from the use of technology in their educational activities. Therefore, they could easily speak of an education (or even an anti-education) *by* technology.

For example, Teacher 10 stated:

Since I started using the smartboard in my classroom, my students have paid less attention to taking notes because they know that everything, I write on the board can be saved. This, in turn, reduces their active engagement in the learning process. On the other hand, if I were to tell them that I do not save my writings on the board, it would create an unethical and unfair image of me in their minds.

Only one of the interviewees considered the value-laden agency of technology to be a result of his inability to control and manage educational technologies in the classroom, rather than an inherent characteristic of technology itself.

PPTET 3: Socioeconomic Empowerment vs. Reinforcement of Inequality

During the COVID-19 pandemic and its aftermath, the notion that educational technologies could play a significant role in expanding access to equitable educational opportunities gained traction. In Iran, numerous applications and platforms emerged over these years, claiming to

provide basic and complementary instructions in diverse subjects such as literacy, mathematics, and science. This claim, when considered alongside structural inequalities—such as the uneven and inconsistent system of teacher recruitment, allocation, and retention in schools, the imbalance in the distribution of educational spaces, and the low per capita educational resources—offers the hope that educational media can help mitigate these disparities and take a step toward educational democracy.

Conversely, when the distance education offered in recent years was compared to in-person instruction, a new hypothesis emerged: access to and utilization of distance learning opportunities are themselves shaped by underlying economic and sociological factors. In reality, participation in such forms of education appears to be reinforcing these very factors, further entrenching class-based disparities within the learning community.

This theme and the resulting internal dichotomy became a subject of considerable debate among the participants. In fact, all of them (n=12) acknowledged that these two phenomena are not separate and cannot occur independently of one another. In other words, from the perspective of all interviewees, practices such as engaging in distance education, using social media to share educational resources, assigning supplementary exercises for home learning, integrating educational technologies into teaching, or even instructing students on how to use certain technologies at home—while they may initially present themselves as egalitarian initiatives—ultimately contribute to the deepening of economic and social inequalities.

For example, Teacher 1 stated:

A student's technological literacy and their ability to utilize educational technologies—in any form, from educational media to smartphone applications and educational websites—cannot be separated from the technological literacy of their family. This is precisely where differences in financial well-being and social status among families begin to manifest their impact.

Or, as Teacher 5 stated:

What we, as teachers, teach about educational technologies in the classroom or how we use them—whether inside or outside the classroom—is never confined to what we explicitly say or do. In fact, it may be inherent to new technologies and the current digital world that students are always led toward something more. And at this point, the student with greater financial means and higher technological literacy is the one who pursues this 'something more,' which, in turn, creates a form of inequality among learners in the classroom.

PPTET 4: The Teacher as a Technology Enthusiast or a Romantic Humanist

A recurring theme in the philosophy of educational technology concerns the polarized ways in which teachers position themselves toward technological change. While the first theme (PPTET 1) addressed the ontological status of technology (whether it is controlled or autonomous), this fourth theme shifts focus to the professional identity and affective stance of the teacher. The tension here is not about the power of the tool, but about the self-conception of the educator. Within this spectrum, one can discern two dominant orientations that emerged vividly in this study: the technology enthusiast and the romantic humanist. The former represents a deep-seated confidence in the progressive power of technology—an optimism that regards technological tools as inherently beneficial and indispensable for modern education. The latter, by contrast, embodies a more reflective, critical, and sometimes nostalgic attitude toward the human dimensions of teaching and learning that risk being eclipsed by the technological imperative.

As Postman (Postman, 1995, 38) famously observed, “nowhere do you find more unexamined enthusiasm for Technology than among educators”. This observation remains strikingly relevant. Many educators, driven by institutional expectations or cultural narratives of progress, tend to equate educating with information delivery, often through entertaining or efficient digital means. In doing so, they may conflate the use of technology with pedagogical innovation, overlooking the deeper epistemic and ethical implications of such transformations. As critics have argued, this kind of unreflective enthusiasm can obscure the complex ways technology reshapes human relations, cognition, and the very aims of education.

Teachers who resist or question technological integration are often labeled in dismissive terms such as “laggards” (Rogers, 2003) or “resisters” (Rossing, 2012). Such labels carry an implicit moral hierarchy, privileging adoption and innovation over hesitation and critique. Yet, as Postman warned, technology is not always good, certainly not neutral, and must be subjected to careful philosophical scrutiny if we are to use it consciously—rather than, as he puts it, let it use us. Technology enthusiasts frequently overlook this necessity, attributing any adverse effects not to technology itself but to its supposed misuse, thereby reducing complex cultural and moral issues to matters of technical efficiency.

Out of the twelve participants, five expressed predominantly *technology-enthusiastic* orientations, while seven articulated perspectives that align more closely with a *romantic humanist or critical-humanistic* stance. Although these orientations were not always mutually exclusive—some teachers oscillated between optimism and skepticism—the dichotomy nevertheless captured a central tension in their reflections on technology and education.

Teacher 9 in an enthusiastic manner, states:

The pace and scope of technological progress are so extensive that it is no longer conceivable to remain outside this sweeping movement. Moreover,

when we look at the historical trajectory of technological development, we see that technology has ultimately brought comfort and well-being to human life. Education is no exception to this reality.

Or, Teacher 11, expressing a romantic–humanist position, states:

The persistent emphasis from higher levels of the system on using technology in the classroom gradually gives me the feeling that I am merely a technological operator rather than a true teacher who carries ethical and human responsibilities.

Contextualizing the findings

While the four Philosophical-Pedagogical Themes in Educational Technology (PPTETs) identified in this study reflect universal tensions in the integration of technology into education, their specific manifestations and intensity among Iranian teachers are deeply rooted in the unique historical, political, and cultural fabric of Iran. The findings cannot be fully understood without considering this distinctive context.

Historically, the Iranian educational system has been fueled by a narrative of modernization and catching up with the West, traceable to questions raised by figures like Abbas Mirza and later by intellectual reformers such as Mīrzā Malkūm Khān, Mīrzā Faṭḥ-‘Alī Ākhūndzādeh, and Tālebūf-e Tabrīzī who vehemently advocated for modern sciences and educational reforms as the remedy for Iran’s perceived stagnation (Ghasemi-Pooya, 1998). This has created a persistent policy dream where technology is envisioned as a shortcut to compensate for the chronic inefficiencies and seemingly unsolvable crises of the education system. National documents, such as the National Development Plan for Information and Communication Technologies in Education (Supreme Council of Education, 2007), often reflect this desire to bypass fundamental structural problems through technological solutions.

This top-down, centralized approach to “educational technology” has consistently faced challenges. Technologies often develop organically in society before the state attempts to control and regulate them, partly because these technologies are predominantly designed, produced, and developed elsewhere. This creates an inherent tension and a sense of technological determinism (as seen in PPTET 1), where teachers may perceive technology as an external, overpowering force dictated by distant policymakers and global markets, rather than a tool under their pedagogical control.

The Iranian school possesses an Islamic (somehow Romantic) foundation that emphasizes the inherent dignity of humans and the sacred status of the teacher. This ethos, combined with a sometimes-deterministic reading of Heidegger that views the “essence of the Western Technology” (Al-e-Ahmad, 2001) as an inhuman logic, places a high value on humanistic education aimed at cultivation of the whole person (Parvaresh) over mere instruction

(Āmūzesh). The COVID-19 pandemic made the psychological and ethical consequences of school closures tangible, making inefficient virtual education a concrete reference point for these concerns. Therefore, the inclination towards romantic humanism (PPTET 4) is not merely a personal preference but a defense of a deep-seated cultural and pedagogical value that prioritizes authentic human relationships and the moral role of the teacher-student bond. This is often intertwined with a cultural anxiety that Western educational technologies could gradually eroding indigenous values and identities.

Finally, the acute awareness of educational inequality in Iran gives the dichotomy in PPTET 3 a particular urgency. While some groups genuinely hope that expanding technology can achieve educational justice in a context of stark disparities, the teachers' unanimous consensus that technology deepens existing divides is a direct reflection of Iran's specific socioeconomic structure. It highlights how access to and the ability to benefit from technology are themselves products of pre-existing economic and cultural capital, which are unevenly distributed in Iranian society. Thus, the teachers' philosophies are a pragmatic response to the realities of their environment, where technological solutions are often imposed without addressing the underlying structural injustices.

Therefore, the considerable ambivalence and contradiction evident in the findings—this oscillation between optimism and skepticism, a sense of agency and determinism—are the direct outcome of these layered historical experiences, which are deeply etched into the collective memory of the Iranian teaching community.

A Stieglerian Critique

A synoptic examination of Iranian teachers' philosophical perspectives on technology reveals that, overall, a skeptical profile (Jang et al., 2024) toward technology is predominant. Yet, what directs us toward answering the second research question is that their views still rest upon an inherent dualism between the human and *technê*. Such a standpoint prevents a recognition of technology's fundamental mediating nature in human relations. This section addresses the second research question of the article—“What insights does Stiegler's transcendental philosophy offer into the philosophy of technology among Iranian teachers?”—by critiquing four fundamental dualities revealed through field research. This analysis will demonstrate that the teachers' seemingly contradictory attitudes are, in fact, symptomatic of a deeper crisis within techno-psychic and techno-social processes, which Stiegler addresses through his concept of the *pharmakon* and *general organology*¹.

¹ Stiegler developed an organological theory of human-technology-society interaction. His general organology considers human evolution and history as processes of technicalization involving three systems of organs: (1) psychosomatic organs, (2) social organizations, and (3) technical organs. Changes in technical organs invariably cause dysfunctions and rearrangements in the psychosomatic and social organs. The relations between these three organ systems are transductive in nature, meaning they only take shape within and through their relation to one

Although Feenberg's framework was useful for the initial analysis of the teachers' views, its theoretical limitations in fully explaining the complexities of the empirical data led us toward Stiegler's transcendental philosophy. While Feenberg consistently emphasizes that humans are technical beings and that humans and technology co-constitute each other in a way, his understanding of this co-constitution is primarily sociological and never addresses the ontological, neurological, psychological, libidinal, and cognitive dimensions of this synthesis (Lemmens, 2014). Feenberg's critical theory is highly effective for analyzing *technological choices and practices*, but it tends to bracket the question of how technology *constitutes* the very processes of human individuation and historical time. Concerns over attention, memory, and the core identity of teaching require a more metaphysically engaged critique. Therefore, we turn to Bernard Stiegler's pharmacological perspective. Stiegler's concept of the *pharmakon*—a technology that is simultaneously *poison and cure*—allows for a deconstruction of the binaries identified in the PPTETs. This move enables us to transcend the notion of technology as an external tool (Feenberg) to understand it as a constitutive force in human existence.

Commenting on these dualities requires speculation in the realms of ontology, anthropology, and cognitive sciences, areas in which Stiegler possesses sufficient depth. For Stiegler, digital technologies represent an epochal technological transformation. These technologies are fundamentally reconfiguring human subjectivity, much as writing did in ancient Greece at the time of Plato. They are also reconfiguring our neural structures, transforming our brain's architecture from "reading brains" to "digital brains," just as writing transformed the oral brains of our pre-literate ancestors into reading brains.

This multi-level analysis by Stiegler—encompassing the psychological, cognitive, neurological, and social dimensions of technology—is precisely what is needed for a deeper understanding of the Iranian teachers' perspectives. While Feenberg remains at the sociological level of analysis, Stiegler enables an investigation into technology's impacts on the psychic, cognitive, and even neuronal levels.

Some remarks on Stiegler's transcendental philosophy of technology

Bernard Stiegler's philosophical project represents a radical reconfiguration of the Kantian transcendental tradition by placing technics at its core. Rather than abandoning transcendental inquiry, Stiegler advances what Lemmens (2022) calls "the technologization of the transcendental," centered on the notion of the a-transcendental. This concept suspends the classical empirical/transcendental distinction by showing that technology functions as the

another. What is crucial in the current context is that the relations between these three organ systems form circuits of desire, of libidinal energy, as technical organs and social organizations shape the drives residing in psychosomatic organs. Stiegler argues that technical organs can both intensify the binding of drives into libidinal energy, supporting processes of sublimation and psychic elevation, and cause their unbinding, leading to desublimation and psychic regression. In this way, every organology constitutes a libidinal economy.

“aposterioric a priori” (Lemmens, 2022, 1311)—an empirical phenomenon that nonetheless becomes an a priori condition of possibility for knowledge and experience. As Crevoisier (2024, 4) emphasizes, the a-transcendental is neither empirical nor transcendental but occupies a “third realm” of “trans-empirical conditions.” In this framework, the Kantian transcendental subject loses its status as the autonomous ground of experience. Stiegler introduces a “fourth synthesis,” the technological synthesis (Wambacq et al., 2018, 141)—which underlies the three Kantian syntheses of apprehension, reproduction, and recognition. This move reveals a fundamental dependency: the subject's cognitive operations presuppose technical exteriorizations and are thus historically and materially conditioned.

This claim becomes explicit in Stiegler's analysis of Kant's neglect of “tertiary retention.” Stiegler argues that Kant “commits the same error Husserl will accuse Brentano of... He is clearly referring to primary retentions, even while he claims to be describing the synthesis of reproduction” (Stiegler, 2011, 43). Consequently, the transcendental unity of apperception is not an internal faculty but a process enabled by technical supports—“a cinematic projection” dependent on its prosthetic milieu. This reading is reinforced by Kant's own admission that “inner experience is itself possible only mediately, and only through outer experience,” (Kant, 1965, 246) which Stiegler reframes by showing that this “outer” is already mediated by tertiary retention: “Tertiary retention is the prosthesis of consciousness without which there could be no mind, no recall... no culture” (Stiegler, 2011, 39). Hence, “any politics of consciousness (and what is politics if not, from beginning to end, a politics of consciousness?) is necessarily a politics of technics.” (Stiegler, 2011, 78).

This reorientation dismantles the Kantian autonomous subject and replaces it with a “reconstituted subject” that individuates itself only retroactively through its relations with technical systems (Crevoisier, 2024, 3). Individuation is therefore always triple—psychic, technical, and social—a triad elaborated in Stiegler's “general organology” (Alombert, 2024, 8). Through the concept of “epiphylogenesis,” Stiegler situates this transcendental shift historically. Technical exteriorization produces a non-genetic cultural memory that underwrites tradition, learning, and historicity, thereby shaping the temporal-transcendental structure of consciousness itself. This renders technics not merely an instrument but the very milieu within which the human emerges and individuates.

This Stieglerian lens enables a deeper interpretation of the empirical data gathered from Iranian teachers. Their seemingly straightforward dichotomies about technology should be read not as isolated opinions but as manifestations of “complex pharmacological processes” operating across psychic, technical, and social individuation. This framework thus reveals the deeper structures conditioning teachers' philosophical orientations and helps illuminate how their pedagogical identities are shaped within technologically saturated environments.

The subsequent critique employs the framework of four dichotomies, yet this categorization must be interpreted with caution. These perspectives are not static or binary; rather, they are dynamic, context-dependent, and fraught with internal tensions. This oscillation is not a weakness of the analysis but the key to a deeper understanding of the teachers' flexible, and at times paradoxical, response to a complex technological environment.

Critique of PPTET 1

“Pedagogical Determinism” is fundamentally grounded in a metaphysical dualism: it posits the human subject as an independent, a priori agent confronting an object called “technology,” which possesses a merely instrumental existence. This position, clearly traceable in Teacher 1’s statement—“In the classroom, technology functions as a neutral tool”—fails to grasp that technology is never in a subordinate position to human will. Rather, it always operates as a precondition for attention, thought, and action.

Stiegler (1998) challenges this dualism at its most fundamental level by introducing the concept of *tertiary retention* (external memory aids like writing or digital media). He argues that the human is not the master of technology but a being whose existence is determined from the very beginning as *being-in-technology*. These technologies, from language to the digital, are not merely external appendages but, as prosthetic extensions, shape human cognitive structures and realms of desire. Consequently, the notion of a pre-constituted subject that can simply enlist technology into its service is an illusion.

The instrumentalist view, by reducing technology to a “tool,” marginalizes its ambiguous and crisis-inducing duality, conceptualized in Stiegler’s deconstructive philosophy through the concept of the *pharmakon* (a substance that is both poison and cure). From the perspective of *general organology*—wherein the *pharmakon* is defined as an artificial organ irrevocably grafted onto the organic body of human psycho-social life—no technology can be directed solely by individual will. Teacher 10’s observation that “my students have paid less attention to taking notes because they know that everything, I write on the board can be saved” concretely exemplifies this. The smartboard, as a new *technical organ* (Lemmens, 2011, 36), transforms the function of the students’ memory (*biological organ*) and their expectations of the teacher (*social organ*). The technology substitutes external digital memory for internal cognitive engagement. Stiegler’s philosophy dissolves the dichotomy by positioning technology not as an object (“tool”) but as a relation (“*pharmakon*”) (Heidenreich, 2022, 89) that conditions the spatio-temporal structures of the human mind.

Conversely, the attitude manifested in the statement of Teacher 4 who referred to technology as a “powerful and almost unchangeable force” falls into the trap of technological determinism. Stiegler (1998), relying on the analyses of Bertrand Gille, exposes this reading of technology as a “modern myth.” He argues that technological progress is deeply integrated within a broader “socio-economic fabric,” where social agency plays a central role. While technology tends to

evolve faster than the psyche and society, leading to “imbalance” and a “crisis-prone” condition, the current crisis is not caused by technological determinism but is the result of surrendering the process of technological appropriation to the destructive logic of neoliberal capitalism. This system, by industrializing memory and attention, creates the *illusion* of determinism by short-circuiting knowledge reproduction circuits. This attitude transforms teachers into “passive spectators” or “reactionary technophobes,” depriving them of the possibility of “active resistance and the reappropriation of technological systems.”

Critique of PPTET 2

The majority of teachers who point to the unintended and value-laden consequences of technology have inadvertently arrived at an understanding of technology as a *pharmakon*. They have realized that educational technology is not merely a mediator but an active epistemic agent that participates in the production of knowledge, the shaping of values, and the definition of what constitutes the “educational.” When a student abandons note-taking due to the presence of a smartboard, it is not merely a “behavior” that has changed; their cognitive organology has been transformed. Crucially, Stiegler’s organological view posits no inherent essence or linear causality for technics. Rather, the context and grounds of causal relations always combine causal factors, transforming the process of human individuation (the process of becoming a distinct individual) (Heidenreich, 2022). The teachers’ experiences can be analyzed through an entropic/negentropic framework (a tendency toward systemic closure through standardization versus a tendency toward bifurcation through the production of new knowledge). When technology leads to reduced active engagement and confusion in the teacher’s role, it reinforces “entropy” in the system. Conversely, the teachers’ recognition of these unintended consequences represents an initial negentropic act—the first step toward awareness, resistance, and ultimately the “reappropriation” of technology. Stiegler develops a quasi-causal framework (drawing from Deleuze) that foregrounds human participation in resisting entropy (Stiegler, 2022). This relationship is not a classical, linear Aristotelian causality but a pharmacological quasi-causality because the effects of technology are always dual and unpredictable. Teacher 10’s dilemma with the smartboard perfectly illustrates this: the saving feature (seemingly positive) unexpectedly leads to reduced deep note-taking (negative outcome) while simultaneously creating an ethical bind for the teacher. This dual, unpredictable effect exemplifies quasi-causality. These consequences emerge from the complex network of relations between the technical, psychic, and social organs, proving that technology is not a neutral, predictable tool. The realization of this ambiguity is the first step toward creating a “bifurcation” from the current entropic situation towards what Stiegler terms the *Neganthropocene* (an era oriented toward the deliberate production of order, knowledge, and care in opposition to entropic tendencies) (Stiegler & Ross, 2018).

Critique of PPTET 3

Proponents of the empowerment narrative perceive technology as the bottleneck for educational transformation, transforming technology into a magic potion through which structural crises of education can be reduced to “technological backwardness.” Paradoxically, this very empowerment narrative ultimately leads to the reinforcement of inequality, as all participating teachers unanimously confirmed. This inherent contradiction is precisely what Teacher 1 aptly expressed: “A student’s technological literacy cannot be separated from their family’s technological literacy.”

Stiegler saw seductive slogans like “knowledge-based societies” as a mask for the systematic destruction of knowledge and human subjectivity (Lemmens, 2011). He warns that the process of generalized proletarianization (the systematic loss of individual knowledge, know-how, and capacities to increasingly automated and industrialized technical systems)—the stripping away of an individual’s time, attention, knowledge, and capacity for judgment—leads to the systematic destruction of knowledge and the collapse of the human subject as a “creator of meaning.” Even if access to devices and the internet were provided equitably, it is the political-economic-social context of the platforms that determines the content and path of learning. The student, instead of being a “creator of knowledge,” becomes a “passive consumer” of pre-determined data. This is what Stiegler calls symbolic Misery (Stiegler, 2014); a condition where the individual loses the ability to create meaning and participate in knowledge production.

This process of cognitive proletarianization directly impacts teachers as well. Teacher 11’s concern about becoming a mere “technological operator” serves as a concrete example of how external pressure to adopt technology can strip away the teacher’s *savoir-faire* (pedagogical know-how) and *savoir-vivre* (ethical understanding of the profession) (Lemmens, 2011). The teachers’ observations clearly demonstrate the “poison” aspect of the *pharmakon* (inequality in access and basic usage ability) (Khodaei et al., 2023). A sole focus on “equity of access” distracts us from the more fundamental issue—namely, the “generalized proletarianization” and “symbolic poverty” driven by hyper-industrial capitalism.

Critique of PPTET 4

The dichotomy of techno-enthusiasm (Teacher 9) and romantic-humanist resistance (Teacher 11) stems from a misunderstanding of pedagogy as an inherently technical matter—a technics that conditions the ontological foundation of the human subject itself and the very possibility of thought (Stiegler, 1998).

Building on Leroi-Gourhan, Stiegler posits that the distinction between humans and animals lies in the human capacity to *exteriorize* their epigenetic memory in the form of stable technics (tertiary retention). This means education has always been technological. “Since script was invented and started to play a crucial role in human culture, humans born in literate societies

have been trained in such a way that they literally became different creatures than their ancestors” (Vlieghe, 2018, 419). Words and vocabulary function as artificial organs, and institutions like the school (*scholè*) are responsible for forging intergenerational cultural connections and internalizing these technics (Stiegler & Ross, 2017, 390-391). When Teacher 9 celebrates technology’s progressive power and Teacher 11 mourns the loss of human connection, both fail to recognize that the very “ethical and human responsibilities” that Teacher 11 values were made possible by educational technics like writing and institutional practices (Oliverio, 2020).

For Stiegler, the school is a historical system of sublimation, adapting biological organisms to the dominant technics of the age. The current polarization reflects a disruption in the *organological composition* of education. The derogatory labeling of skeptical teachers as “laggards” or “resisters” fails to understand that healthy educational development requires equilibrium between psychic, technical, and social organs. Digital technologies constitute new “technics of attention” that can either enrich or impoverish educational relationships.

Ultimately, both Teacher 9’s techno-enthusiasm and Teacher 11’s humanistic resistance represents disruptions in the process of *individuation*. The former risks *disindividuation* (loss of individuality through standardization) through uncritical adoption, while the latter risks *reactive disindividuation* through nostalgic withdrawal. The empirical data reveals that the most urgent task is developing what Stiegler calls “new circuits of transindividuation” (the collective creation of shared meanings) (Stiegler & Rogoff, 2010)—educational practices capable of mediating between digital technics and pedagogical traditions. The solution lies not in choosing between these poles, but in the “therapeutic” work of critical reappropriation, assuming that technology alone could never usurp the teacher’s place.

Reappropriating the Technosphere: Stiegler’s Educational Project

While the imperative for teachers to navigate the technologically saturated classroom is often treated as a matter of individual, localized practice—contingent on specific contexts and resources—this micro-level focus appears insufficient against the vast scale of the planetary crisis. This crisis, identified by Bernard Stiegler as the fundamental characteristic of the Anthropocene, operates through systemic processes that structurally limit individual agency. Teachers, caught between the attentional capture of “programming industries” and a curriculum ill-equipped for the digital age, often find their capacity for transformative action pre-emptively constrained.

However, a close reading of Stiegler’s interview, “The School of Tomorrow” (Stiegler et al., 2020), reveals that his response to this double bind is not a surrender but a call for a multi-scalar war of position. He articulates a framework for action that operates simultaneously at macro, meso, and micro levels. Stiegler’s confrontation with the educational crisis represents a Pharmacopolitics—policymaking grounded in understanding technology as a *pharmakon*

(simultaneously poison and antidote). To operationalize this view, he proposes the following institutional and structural measures:

- **Re-conceptualizing the Curriculum:** Stiegler argues for a move away from an instrumental view of technology toward a “General Organology.” This involves developing a curriculum that examines the curative and toxic dynamics of technics across disciplines, primarily as an antidote to the proletarianization of teachers and students—the loss of *savoir-faire* (know-how) resulting from the purely instrumental use of digital tools. Specifically, this requires integrating the history of technics—drawing on André Leroi-Gourhan’s analyses in *Gesture and Speech* regarding the exteriorization of memory—and the study of the biosphere’s transformation into a technosphere, as conceptualized in Vladimir Vernadsky’s *The Biosphere*. Furthermore, philosophy education must be deeply reformed to incorporate these issues, reconstructing the history of philosophy to account for the technological conditioning of thought in order to cultivate critical judgment—the capacity to appropriate the technical conditions of existence rather than simply being subjected to them.
- **Transitioning to Contributive Methodologies:** To create dynamic learning spaces, Stiegler proposes implementing “Contributive Research,” as outlined in the Jules Ferry 3.0 ([Conseil national du numérique, 2014](#)) report. This methodology requires transdisciplinary teams to work directly with the “inhabitants” of a field, sharing research results continuously rather than solely at the end of the project. A concrete application of this is the establishment of “contributive clinics” to address digital intoxication in families. These spaces should be guided by therapeutic principles as exemplified in D.W. Winnicott’s concepts of “holding” and “transitional objects” (from *Playing and Reality*), creating a safe environment to rebuild social ties disrupted by screen addiction.
- **Revitalizing Craftsmanship and Practical Skills:** Institutional modernization requires redefining practical skills to combat the entropy of knowledge. Stiegler advocates for a return to craftsmanship, inspired by Richard Sennett’s *The Craftsman* and his reading of Hannah Arendt’s *The Human Condition* (specifically her distinction between labor, work, and action). This approach emphasizes that material engagement is essential for thinking. These changes should not be imposed by decree but fostered through experimental “Contributive Learning Territories” involving teacher training colleges.
- **Combating Proletarianization:** The educational institution must redefine its relationship with the economy to counter the “proletarianization” of the mind—defined here as the loss of knowledge (*savoir-faire* and *savoir-vivre*). Stiegler identifies

a competition between the audiovisual/algorithmic “programming industries” and academic “programming institutions.” To confront this, he proposes establishing “Digital Studies” as an independent academic field and creating high-level competitive examinations to elevate the status of technological pedagogy.

- **Enacting Legal and Transnational Frameworks:** Addressing the fragmentation of knowledge requires large-scale legal action tailored to the context of the Anthropocene. Stiegler calls for a “European awakening,” suggesting the creation of regional alliances among culturally similar countries. These alliances would foster educational-technological sovereignty to collectively confront challenges such as cultural homogenization or technological sanctions.
- **Establishing a New Epistemological Foundation:** At the deepest level, Stiegler insists on a “hypercritique” of the Anthropocene—a critique that questions the very conditions of critique itself. This necessitates a return to “French Theory” to uncover epistemological repressions. It requires a new pharmacological approach based on organology (the study of the co-evolution of physiological, artificial, and social organs) and a reconsideration of recursivity in open exosomatic systems.

Conclusion

This study has sought to illuminate the implicit philosophies of technology held by Iranian secondary school teachers and to critically examine these orientations through the lens of Bernard Stiegler’s transcendental philosophy of technics. By employing Feenberg’s typology as a sensitizing framework and subsequently extending the analysis through a Stieglerian critique, this research has demonstrated that the seemingly heterogeneous and, at times, contradictory stances of teachers toward educational technology can be understood as manifestations of a deeper, structurally conditioned tension. Specifically, teachers oscillate between enthusiasm and skepticism, autonomy and determinism, empowerment and inequality—oscillations that reflect not merely individual dispositions but systemic and socio-technical forces shaping pedagogical life in contemporary Iran.

In closing, this study calls for a renewed attentiveness to the formation of technê-subjectivities in education. Rather than positioning technology as either a threat to humanistic education or an inevitable pathway to modernization, it is imperative to reconceptualize education as a site of pharmacological struggle—wherein the task is not simply to adopt or resist technological tools, but to cultivate modes of collective individuation capable of transforming technological systems toward negentropic ends. Future research would do well to explore how such practices of technological care and critical appropriation can be institutionally supported and pedagogically enacted within different educational contexts. Only through such efforts can education reclaim its role as a space for the cultivation of emancipatory intelligence

in an era increasingly defined by algorithmic rationality and digital industrialization of attention.

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