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Rethinking the Development Paradigm in Higher Education: Educational Communication in the Age of Technological Transformation

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Abstract: This article critically re-examines the educational “development paradigm” as a foundational methodological assumption of higher education in the context of accelerating technological transformation and artificial intelligence. It is argued that the traditional understanding of development as an inherently positive educational objective requires critical reconsideration. It is demonstrated that human development, technological development, and educational development no longer represent convergent trajectories and therefore should be conceptualised as complementary yet analytically distinct dimensions. Based on theoretical analysis, comparative interpretation, and critical synthesis of interdisciplinary scholarship, the growing divergence between the exponential dynamics of technological innovation and the cognitive, ethical, and communicative capacities of human beings is examined. Particular attention is devoted to educational communication as the principal mechanism through which knowledge is co-constructed, meanings are negotiated, and human agency is sustained within technology-mediated learning environments. The concepts of sustainable development, limits to growth, limits of destruction, posthumanism, and technological singularity are analysed in relation to their implications for higher education. It is substantiated that technological innovation should be evaluated not solely in

terms of efficiency and economic performance but also according to its contribution to human flourishing, ethical responsibility, and democratic participation. It is concluded that the educational “development paradigm” should be reconceptualised as a differentiated methodological framework integrating technological progress with human agency, communicative ecosystems, educational communication, and future-oriented education in an AI-mediated society.

Keywords: higher education, educational “development paradigm”, pedagogical communication, AI-mediated communication, posthumanism, communicative ecosystems; future-oriented education.

Introduction

Technological advancements are dramatically reshaping higher education and challenging established approaches to its development. In this context, the “development paradigm” refers to the main assumptions and priorities guiding higher education, particularly its emphasis on achievement, professional skills, innovation, and technological advancement (Barnett, 2000). [1] The rapid progress of AI and digital technologies increasingly challenges this logic by transforming how we learn, communicate, and produce knowledge (UNESCO, 2023). [2] Digital technologies have transformed educational communication from knowledge transmission into a socio-technical process involving human agency, technologies, and AI (Goodyear & Carvalho, 2014; Selwyn, 2011; UNESCO, 2023). [3] Human agency is therefore understood as a relational capacity emerging through interactions with educational, technological, and social environments (Biesta, & Tedder, 2007). [4] At the same time, humanistic dimensions of education, including ethics, personal development, and learner-centredness, are increasingly mediated by digital systems and algorithmic processes, raising questions about the balance between technological optimisation and the humanistic mission of higher education (Biesta, 2010; Selwyn, 2011). [5] These transformations intensify debates on whether technology enhances human development or reshapes the meaning of education itself (Braidotti, 2013; Haraway, 1991). [6] Consequently, the development paradigm requires critical reconsideration in the digital age.

This article aims to critically reassess the development paradigm in higher education and examine its implications for educational communication amid rapid technological transformation.

The study employs qualitative conceptual and critical interpretive analysis of a purposively selected corpus of 33 scholarly, philosophical, and policy sources. It ranges from works first published in the mid-twentieth century to recent scholarship and policy documents published up to 2025, combining historical foundations with contemporary perspectives. The analysis proceeded in three stages: identifying key assumptions underlying different understandings of de-

velopment; comparatively examining these assumptions across educational, philosophical, technological, and communication scholarship; and critically synthesising them in relation to technological transformation and educational communication. Particular attention was given to the distinction between development as growth, performance, and technological progress and development as human formation, agency, educational purposes, and sustainability, as well as to the tensions between these trajectories in higher education. A conceptual framework connecting development priorities, technological transformation, human agency, and educational communication guided the interpretation. The study is theoretical and interpretive, does not claim empirical generalisation, and does not constitute a systematic literature review. The literature review uses a conceptual, narrative approach supported by desk research.

Literature Review

To understand how the paradigm of development, and in particular the development of educational communication, can be reconsidered, it is useful to examine the literature from three related perspectives: the concept of paradigm shift, competing understandings of higher education development, and the impact of technological transformation on educational communication.

The first perspective is offered by the philosophy of science. T. S. Kuhn (1997) [7] describes scientific development as a process in which established forms of inquiry may be disrupted when accumulated anomalies can no longer be adequately addressed within the existing paradigm. I. Lakatos (1978) [8], while also addressing the persistence and transformation of established frameworks, focuses on competition between research programmes, each maintaining a relatively stable theoretical core while modifying its auxiliary assumptions. The difference is important. T. S. Kuhn gives greater weight to discontinuity and paradigm change, whereas I. Lakatos explains change through the longer-term competition and adaptation of research programmes. These perspectives are not directly applied to higher education. Rather, they help frame the question of how established assumptions about its development can persist, encounter tensions, and be revised.

The second perspective concerns what is meant by development in higher education. R. Barnett (2000) [9] links the modern university to the increasing uncertainty and complexity of knowledge, which calls into question approaches based on stable and predictable models of development. G. Biesta (2010) [10], in turn, questions the increasing emphasis on measurement and educational outcomes when they become substitutes for broader educational goals and values. Together, these positions suggest that the development of higher education cannot be measured solely in terms of performance and efficiency.

A third perspective concerns technological transformation. N. Selwyn (2011), P. Goodier and L. Carvalho (2014) [11] show that technology can change

not only educational tools, but also learning environments, practices and relationships between participants. OECD (2021) and UNESCO (2023) [12] extend this discussion to artificial intelligence and data-driven technologies, highlighting their potential for education alongside issues of governance, ethics, human agency and responsibility. O. Zavatsky-Richter et al. (2019) [13] also show that the use of artificial intelligence in higher education has developed faster than the pedagogical research needed to explain and evaluate these applications. The literature therefore points to an important distinction: technological transformation is not simply another form of educational innovation; it can also change the conditions in which teaching, learning and educational communication take place.

Another dimension emerges from research on the relationship between humans and technology. D.J. Haraway (1991) and R. Braidotti (2013) [14] challenge the traditional separation between human activity and technological systems, raising broader questions about identity, subjectivity and the limits of the human. Educational policy takes a more cautious stance. UNESCO (2023) [15], e. g., acknowledges the opportunities offered by AI, while emphasizing human control, ethical safeguards and institutional accountability. Thus, there is a contrast between approaches that primarily seek to use technology to improve education and approaches that view technological change as requiring a deeper rethinking of educational relations and human agency.

These lines of research show that the development of higher education is discussed from different perspectives: as improving productivity and outcomes, as adapting to uncertainty and changes in knowledge, as technological innovation, and as transforming educational relations. However, these perspectives are rarely brought together through the conception of the development paradigm itself, especially in relation to educational communication. This provides a framework for examining whether development, innovation, and technological progress can be viewed as inherently positive as technological change becomes increasingly rapid, uncertain, and nonlinear.

The Development Paradigm: From Human Development to Technological Imperatives

Among the paradigms underpinning higher education, the development paradigm has traditionally been regarded as the least contested. Since antiquity, education has been understood as a means of human development contributing to scientific, technological, economic, and social progress. Accordingly, the mission of higher education extends beyond knowledge transmission towards the formation of individuals capable of shaping society. However, contemporary technological transformation has challenged this holistic understanding. Development has increasingly fragmented into measurable dimensions associated with innovation, technological advancement, economic competitiveness, and institutional performance rather than human flourishing. Whether this shift represents

an inevitable societal response or requires philosophical reconsideration remains an open question. Such reconsideration requires viewing education within broader social, technological, and cultural contexts, where the philosophy of education contributes not only to responding to current demands but also to shaping future societal trajectories (Barnett, 2000; Biesta, 2010). [16] Despite these challenges, growth remains a dominant orientation of contemporary society, reinforced by global competition in science, technology, economics, and higher education. However, philosophical, ecological, and systems perspectives increasingly question whether unlimited growth is sustainable within a finite world. The seminal report “The Limits to Growth” introduced the concept of planetary limits into scientific and policy discourse (Meadows et al., 2018) [17], while subsequent analyses have emphasised the incompatibility of continuous expansion with long-term human and environmental sustainability (von Weizsäcker, & Wijkman, 2018). [18]

E. Morin further argues that development is often reduced to growth, obscuring its complex and multidimensional nature. Drawing on K. Boulding’s observation that “Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist” (Morin, 2009) [19], E. Morin highlights that development is constrained by planetary conditions and shaped by the dynamics of growth itself. Similarly, R. Dobelli (2013) [20] notes that human cognition tends to underestimate exponential change, which creates difficulties in anticipating the consequences of accelerating technological innovation.

Therefore, the development paradigm can no longer be treated as an unquestioned foundation of higher education. It requires critical reconsideration in relation to complexity, non-linearity, and the transformative effects of technological and social change. This reconsideration also affects educational communication: if development is understood as a complex and multidimensional process rather than continuous growth, communication should move beyond knowledge transmission towards critical dialogue, collaborative knowledge construction, ethical reflection, and navigating uncertainty. Educational communication becomes a constitutive element of higher education through which understandings of development, human agency, and technological progress are negotiated. The transformation of the development paradigm requires a corresponding transformation of communication, shifting from the reproduction of established models of progress towards critical, reflexive, and future-oriented academic discourse. This perspective aligns with the concept of pedagogical augmentation, which argues that technologies should enhance rather than replace human educational interaction while preserving communication, creativity, and human agency as fundamental characteristics of education (Chursin et al., 2022). [21]

Development Across Multiple Spaces: Technological Transformation and Educational Communication

The development paradigm becomes more complex when considered through the diverse spaces in which human activity occurs. Physical, biological, social, cultural, technological, and communicative environments shape development through different dynamics and limitations (Morin, 2009). [22] Development is therefore not a uniform process. Some domains, such as resources, institutions, and human time, are finite, while knowledge, communication, and information may expand through interaction and technological mediation (Meadows et al., 2018; von Weizsäcker, & Wijkman, 2018). [23] Understanding development requires attention to both its objects and the contexts in which it is evaluated.

For higher education, this distinction is essential: technological systems may expand rapidly, while human cognitive, emotional, and communicative capacities remain limited. Educational development therefore depends not only on innovation but also on communication through which knowledge is interpreted and transformed into meaningful learning (Garrison, 2016; Goodyear, & Carvalho, 2014). [24]

The multidimensional nature of development means that progress in one area may create unintended effects in another. T. Antonenko and M. Chursin (2019) [25] emphasise that increasing non-linearity requires critical reflection on educational change, as technological efficiency does not necessarily ensure better dialogue or human development.

Technological and human development remain dependent on finite resources and social conditions: technology requires infrastructure and investment, while human development depends on education, time, interaction, and public support (Barnett, 2000). [26] The relationship between humans and intelligent technologies further transforms the development paradigm. AI systems now generate content, support decisions, and participate in knowledge production, reshaping educational communication through human–AI interaction (UNESCO, 2023; Walsh, 2025; Garrison, 2016; Holmes et al., 2019). [27]

The different temporal dynamics of technological and human development create an increasing gap between accelerating technological capabilities and slower processes of learning, ethical judgement, and communicative competence (Kurzweil, 2005; von Weizsäcker & Wijkman, 2018; Dobelli, 2013; Walsh, 2025). [28] Therefore, higher education must address whether communication should merely adapt learners to technological acceleration or preserve spaces for dialogue, ethical reflection, and human development. Since technology's educational effects depend on the contexts in which it is embedded, the key challenge is sustaining meaningful human agency in technology-mediated learning environments (Braidotti, 2013; Haraway, 1991). [29]

Reconsidering Development: Human Agency, Technological Transformation, and Educational Communication

The growing divergence between human and technological development raises questions that extend beyond educational theory and require philosophical reflection on the relationship between technology, society, and humanity's future. Higher education is therefore expected not only to respond to external demands but also to critically examine development models and shape future social trajectories through educational communication (Barnett, 2000; Biesta, 2010). [30] One early attempt to address the tension between technological progress and human survival was proposed by P. Kuusi, who argued for a transition from uncontrolled development towards managed evolution, suggesting that managing evolution should become a doctrine of human survival (Kuusi, 1985). [31] However, this raises fundamental questions concerning who has the authority and legitimacy to guide such processes. In pluralistic societies, these issues remain philosophical and require continuous public deliberation rather than purely technological solutions.

A different response emerged through the concept of sustainable development, defined in the Brundtland Report as development that meets present needs without compromising future generations' ability to meet their own needs (World Commission on Environment and Development, 1987). [32] Since then, sustainability has become a major framework of international policy, including the United Nations Sustainable Development Goals (United Nations, 2015). [33] Nevertheless, tensions remain between continuous technological and economic expansion and ecological, social, and human limitations (Meadows et al., 1972; von Weizsäcker, & Wijkman, 2018). [34]

Higher education plays a crucial role in addressing these tensions. It is increasingly expected not only to transmit knowledge but also to prepare learners to understand complexity, navigate uncertainty, and participate responsibly in shaping the future. These expectations correspond with UNESCO's concepts of futures literacy and transformative learning (UNESCO, 2023). [35] Such transformations redefine educational communication. Rather than simply transmitting established knowledge, communication becomes a process of collaborative meaning-making, dialogue, and knowledge construction capable of addressing complex challenges (Garrison, 2016; Goodyear & Carvalho, 2014). [36] Communicative competence increasingly involves critical evaluation of information, negotiation of perspectives, and the exercise of human agency within digitally mediated environments.

The growing role of artificial intelligence further intensifies these challenges. Posthumanist perspectives suggest that technological enhancement may become a response to the limitations of biological human capacities (Braidotti, 2013; Haraway, 1991). [37] Although such scenarios remain uncertain, they dem-

onstrate that technological development increasingly follows trajectories that differ from human developmental rhythms, widening the gap between technological capability and human adaptability (Kurzweil, 2005; Walsh, 2025). [38] E. Morin (2009) [39] critically examines this divergence, arguing that societies often equate techno-economic development with human development while overlooking possible intellectual, ethical, and social losses accompanying technological progress. Fragmentation, hyper-specialisation, and economic rationalisation may coexist with technological achievements while weakening the ability to understand complexity and engage in meaningful dialogue.

For higher education, this distinction is essential: technological, human, and educational development are interconnected but not identical processes. While technological innovation may accelerate exponentially, human development depends on reflection, ethical responsibility, social participation, and communication. Education therefore serves as a mediating space where knowledge is interpreted, questioned, and reconstructed through dialogue.

This perspective also reflects A. Peccei's argument that future development is limited not only by external planetary boundaries but also by human adaptive capacities (Peccei, 1977). [40] The increasing complexity of artificial intelligence reinforces the need to balance innovation with the preservation of human agency. Therefore, the central challenge for higher education is not choosing between technological progress and human development, but creating forms of educational communication that sustain dialogue between them. Communication grounded in critical reflection, collaboration, ethical responsibility, and future-oriented thinking becomes essential for governing technological development in ways that preserve meaningful human agency.

Rethinking Development Through the Lens of Sustainability and Educational Communication

How can sustainability be meaningfully supported under conditions of accelerating technological transformation? One possible response requires reconsidering the focus of development itself. While earlier debates emphasised the limits of growth and planetary constraints (Meadows et al., 1972) [41], contemporary perspectives increasingly highlight another essential dimension – stability. Sustainability should therefore not be viewed as the opposite of development but as a condition that allows development to remain compatible with human life and social continuity.

From this perspective, sustainable development involves not only balancing economic, environmental, and social priorities but also preserving the conditions that enable societies to remain viable amid technological and economic change. Current sustainability research therefore focuses not only on growth limits but also on critical thresholds beyond which technological, ecological, and

social transformations threaten human systems (Rockström et al., 2009; Steffen et al., 2015). [42] This approach transforms the understanding of development. Rather than a universal process, development should be recognised as involving different trajectories and objects. While technological systems may pursue continuous innovation, human beings and ecosystems require stability and resilience. Sustainable development therefore depends not on unlimited acceleration but on preserving the human and social foundations necessary for future change.

For higher education, this distinction has significant implications. Universities increasingly function within environments shaped by innovation, digitalisation, and artificial intelligence. However, innovation has often become an unquestioned value, treated as an educational goal rather than a means of achieving broader human purposes (Selwyn, 2011). [43] If development is understood as complex and potentially contradictory, educational innovation also requires critical evaluation. This perspective transforms educational communication. Decisions about technological integration should not be based solely on efficiency or competitiveness but should emerge through dialogue among educators, learners, researchers, and society. Communication becomes a space where developmental priorities are interpreted, negotiated, and critically assessed. Higher education should therefore cultivate the capacity to evaluate both the opportunities and consequences of technological transformation (Biesta, 2010; Goodyear, & Carvalho, 2014). [44]

The key challenge is not rejecting technological innovation but establishing criteria for its responsible implementation. Technological developments should be accompanied by interdisciplinary evaluation of their effects on cognitive development, ethical judgement, social participation, human agency, and the quality of educational interaction.

Thus, technological, human, and educational development should not be assumed to follow the same trajectory. Technological development tends towards acceleration, whereas human development depends on reflection, dialogue, ethical responsibility, and identity formation. Educational development mediates between these processes by creating communicative environments that connect innovation with human flourishing.

The development paradigm requires critical reconsideration rather than unconditional acceptance. As E. Morin (2009) [45] argues, development itself should become an object of continuous inquiry. For higher education, innovation and reform should therefore be assessed not only by their ability to accelerate change but also by their contribution to human development, democratic participation, and meaningful educational communication. These perspectives indicate that the development paradigm in higher education can no longer be understood through technological and economic progress alone. Its reconsideration requires connecting technological transformation with human development and educa-

tional communication, since these processes do not follow the same trajectory and may generate tensions between acceleration, human agency, and sustainability. Educational communication consequently emerges as a space in which the opportunities, limitations, and human consequences of technological development can be interpreted, negotiated, and critically assessed.

Artificial Intelligence, Posthuman Futures, and the Future of Educational Communication

Recent decades have introduced a new stage in the relationship between humans and technology. While early artificial intelligence research focused on cooperation between humans and intelligent systems, contemporary trajectories increasingly move towards deeper integration between biological and artificial intelligence, challenging ingrained boundaries between human cognition and computational systems (Walsh, 2025). [46] This transformation has significant implications for educational theory. AI is no longer considered only a technological instrument but also a factor influencing questions of human identity, agency, and the future of education. Posthumanist and transhumanist perspectives suggest that technological enhancement may extend human cognitive capacities beyond biological limitations (Braidotti, 2013; Haraway, 1991; Kurzweil, 2005). [47] Consequently, technology becomes not merely a condition of education but a force capable of transforming its subject. Although these perspectives remain debated, they challenge traditional anthropological assumptions of pedagogy. Education has historically understood learning as a human process involving development, ethical judgement, dialogue, social participation, and agency (Biesta, 2010; Biesta & Tedder, 2007). [48] If technological convergence alters these foundations, higher education must reconsider not only pedagogical methods but also the meaning of educational communication and learning in an AI-mediated world (Harari, 2016). [49]

The idea of technological singularity represents the most radical expression of this transformation. R. Kurzweil (2005) [50] argues that artificial intelligence may eventually merge with human cognitive capacities, creating forms of intelligence that exceed current biological limitations. Regardless of whether such scenarios occur, they raise fundamental questions about the future purposes of education.

From the perspective of educational communication, AI increasingly functions not only as a tool but as an active participant in knowledge generation, interpretation, and interaction. Educational communication therefore becomes AI-mediated, involving learners, educators, and intelligent systems in the construction and evaluation of knowledge (UNESCO, 2023). [51] This creates new opportunities while requiring mechanisms that preserve human judgement, responsibility, and ethical reflection. Transhumanist perspectives propose technological enhancement as a potential stage of human evolution, yet they also require dis-

tinguishing technological possibility from educational value (Bostrom, 2014). [52] Technological advancement does not automatically guarantee human development, stronger communication, democratic participation, or meaningful learning. Therefore, the key challenge for higher education is not whether AI will advance, but how education should respond to its influence. Future-oriented education should develop learners' ability to engage critically with intelligent technologies while preserving ethical judgement, empathy, collaboration, and responsible decision-making. Educational communication becomes the means through which technological innovation remains connected to human values. These concerns reflect earlier arguments by N. Wiener, who emphasised that technology should serve human purposes rather than require humans to adapt to machines (Wiener, 1989). [53] Contemporary discussions of AI similarly emphasise the need to preserve human agency, responsibility, and ethical oversight as intelligent systems become increasingly integrated into social and educational practices (UNESCO, 2023; Walsh, 2025). [54] Further interdisciplinary studies should explore how AI transforms educational communication, including AI-mediated interaction, knowledge co-construction, and communicative agency, while identifying conditions under which technology strengthens rather than weakens human agency, ethics, and democratic participation.

These developments do not reject the development paradigm but demonstrate that development can no longer be viewed as inherently positive or self-evident. The growing divergence between technological and human development requires educational theory to reconsider its foundations. In this context, educational communication becomes a strategic space where technological innovation, human agency, ethical responsibility, and collective meaning-making are negotiated, enabling higher education to support both technological progress and sustainable human futures.

Discussion questions

The analysis shows that the main tension within the contemporary development paradigm lies not between development and technology as such, but between different trajectories of technological, human, and educational development. The reviewed perspectives indicate that technological acceleration cannot by itself serve as a sufficient measure of educational progress. In higher education, this makes educational communication particularly important as a space where technological possibilities are assessed against human agency, ethical responsibility, sustainability, and educational purposes.

Future research should examine the trajectories of human, technological, and educational development in higher education, focusing on their purposes, limits, dynamics, and governance within complex educational environments (Barnett, 2000; Morin, 2009). [55] Technological innovations require pedagogical evaluation that considers not only efficiency but also their impact on human

development, educational interaction, meaningful dialogue, and the human-centred mission of higher education (Chursin et al., 2022). [56] Future research should develop frameworks that integrate technological innovation with human flourishing. Rather than opposing technology and humanity, education should cultivate communicative ecosystems that preserve humanistic values and support AI-mediated futures. This perspective aligns with New Humanism, which views digital technologies as tools for enhancing personal development, ethical responsibility, and meaningful social interaction rather than merely optimising performance (Biesta, 2010). [57]

Conclusions and implications

The analysis demonstrates that the development paradigm, traditionally regarded as a foundation of higher education, requires critical reconsideration amid rapid technological transformation. The growing divergence between human, technological, and educational development challenges the assumption that these processes necessarily coincide. Development should therefore be understood as a differentiated concept involving diverse trajectories, objects, dynamics, and limits. Debates on the limits of growth should be complemented by attention to the limits of destruction and the preservation of human and social foundations essential for sustainability.

Sustainability should guide responsible educational transformation rather than replace development. Technological innovation requires reflection on its effects on cognition, ethics, participation, and human agency, with educational progress assessed not only through efficiency but also through human flourishing.

AI, automation, and posthumanist perspectives further challenge assumptions about learning and the educational subject. Rather than accepting them as inevitable progress or threat, higher education should examine their implications for human identity, educational purposes, and democratic society.

In this context, educational communication becomes central. As AI participates in knowledge creation, higher education must move beyond transmission towards dialogue, collaborative meaning-making, and knowledge co-construction, ensuring that innovation remains connected to human values and responsibility. This perspective integrates human agency as responsible action, educational communication as dialogic knowledge construction, and pedagogical augmentation as technology-enhanced rather than technology-replacing education. These concepts support a renewed development paradigm aligned with human flourishing in the AI age.

Higher education should therefore not merely adapt to technology but shape its responsible integration. The future of education depends on preserving human agency and creating communicative ecosystems that unite innovation, ethical reflection, critical dialogue, and future-oriented learning.

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