The Augmented Human and the Future of EducA(I)tion

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Abstract: Given recent developments in technological advances (chatbots in particular) and, by extension, the gravitational pull to utilize technology (also AI-driven educational technology) in education, a need arises to reconceptualize the most fundamental assumptions and understandings of education itself. This also involves questioning (and possibly even redefining) our humanity and human-ness. I am thinking along the lines of both critical posthumanism and transhumanism. Education hereto meant leading the subject (student, pupil) into humanity and being fully human (Snaza, 2013). But does this definition need reform, and if so, how? Several other questions arise from here: what will happen when – if – human stops being human, at least in the sense understood until today? Will education be defined as something completely different? Will it, say, side-track the foundational role of teachers, schools, curricula, socialization, etc., contrary to the understanding that education means *human* relationships between teachers and students (Knox, 2019)? To these dilemmas, I offer the following lines of thought that do not lead either to unproductive technophobia nor to critiquless euphoria. It is maybe (high) time to think about changing the categories, concepts, and our use of language to describe AI-related issues. I suggest two moves to start with: (1) a move away from anthropocentrism, both in language and concepts, (a) to include non-human entities and (b) to name the hereto unknown and "unconceptualized" phenomena, and (2) a move away from thinking about AI as merely automaton and task substitution agent, and from "injecting" it (Susskind, 2025) into the current ways of going about our business, with the aim for AI to replicate humans' (in our case teachers') work. And, as for education, the use of technology transforms both people and their experiences (Jamison and Haraway, 1992); it may be that digitally transmitted experiences differ from live experiences (i.e., teacher-pupil interactions), so that would require special attention, plus raising awareness regarding emergent hierarchies, most importantly featuring those whose capacities are enhanced by various technologies and those who are not "improved" in that way.

Keywords: Education, Human, Posthumanism, AI, Enhancement

1. Introduction: Setting the Coordinates

In recent years, there has been a growing recognition of the need to reconceptualize the most fundamental assumptions underlying education. This need stems from two interrelated phenomena. The first is a significant technological advancement, with chatbots standing prominently at the forefront of this development. The other is, by extension, the gravitational pull to use technology, including AI-driven technology, in education. It appears that education can no longer be fully understood in terms of human participants alone.

This potential shift is, in part, the result of a specific historical circumstance – namely, the COVID-19 pandemic – which required alternative approaches to schooling due to health and safety precautions. Among these were distance learning (also known as e-learning), virtual classrooms, computer-assisted instruction, and similar. These approaches have continued to evolve even in the post-COVID era. However, they did not always prove as "efficient" as the live educational process, as known hereto, which involves a human teacher. Quotation marks in "efficient" are here for a reason, as "efficiency" would certainly require further elaboration. Does this mean better education, yielding better results that are easily measured, or maybe happier students …? Parenthetically, this also entails a quantification of educational excellence and hereby amplification of inequality in education (Knox, 2019). Then came the excitement connected with chatbots, especially ChatGPT. There are others, but this one seems to have received the most attention; thus, it will be the one mentioned here.

As the hype subsided, the excitement was tempered by concerns about its influence on various aspects of human activity, including education. It appears that this has shaken the educational world also conceptually, raising questions about what education is and what its aims, outcomes, and experiences in the process should be. Moreover, it has begun to pose serious practical challenges, ranging from questions about how to define and prevent academic (dis)honesty (see, e.g., Skonieczny and Vendramin, 2024) to reconsiderations of educational standards – what should be learned, and how. Education has become a space characterized by "not-us thinking," which reflects the belief that "AI has massive potential but 'not for us'" (Susskind, 2025). In other words, a human teacher cannot be replaced by a non-biological entity. And that requires serious thought.

I am not a computer scientist or an expert in artificial intelligence, nor do I have detailed insight into the inner workings of these systems. I approach the issue from a humanities perspective, one that invites broader reflection on the potential impact of AI on education, learning, schooling, and society as a whole. This also means, as Jeanette Winterson has put it, studying the past to understand the present and the future – that is

what the humanities are for (Winterson, 2022). All too often, lessons learned in the past travel poorly to the generations that should make the most of them.

In this contribution, I want to take a look at the possibilities of how education and its aims might be redefined and what education might look like in the near and not-so-near future. What will be the role of the human teacher in live contact vs distance teaching, non-human teacher, and AI teacher (the terms are provisional here)? Is the next step heading in the direction of personalized education and human pupils augmented in various ways?

The focus here will be on modern technology, including computers and related digital devices, as well as artificial intelligence – whether in virtual form or embedded in various types of robots.

But, before proceeding, it's essential to clarify what is meant by the term "technology" in a more general sense. There are two radically different ways to understand it. It can be thought of (1) as a constant presence throughout human evolution – something inherent to our development and "intimately interwoven in the social fabric" (Braidotti, 2019), which is also my point of view, or (2) as a tool, an instrument to be used positively or negatively. The latter side-tracks "technological impact on our daily lives, or our sense of subjectivity and our imaginings" (Braidotti, 2019).

Technology is not a "thing", but as "a space of possibility which configures the way we think, feel, speak and encounter ourselves and others" (Müller, 2016). It might even be needed to think about technology in a way that resists "the intellectually comfortable position of mobilising a false opposition between 'humanity' and 'technology' when looking ahead into our digital future" (Müller, 2016).

The technological side also involves the human side. This means questioning, rethinking, and possibly even redefining our humanity and human-ness. I am thinking along the lines of both critical posthumanism and transhumanism. Although both share a common interest in technology (let us focus only on this aspect here), their relationship with it is structurally different.

Posthumanism is aware of our human epistemic limitations; it opts for a non-hierarchical perspective, so no human primacy is granted, regardless of the kind of human being we have in mind (which is an argument against the alleged universalism of Man). Its epistemology encompasses nonhuman experiences as sites of knowledge, with actors including nonhuman animals, artificial intelligence, robotics, and similar entities (Ferrando, 2019).

Transhumanism, however, opts for a radical transformation of the human condition by existing, emerging, and speculative technologies (e.g., regenerative medicine, radical life extension, and mind uploading). Technology is viewed as a means by which humans might transcend the finitude of life by extending and augmenting the capabilities of our biological bodies (Ferrando, 2013). This kind of emphasis on technology risks pushing humans further into exceptionalism (human vs other non-human biological life forms) if viewed as something that will help us overcome our biological limitations and thus make us, yet again, the most important actor on the stage.

2. Education as an Inherently Human Endeavour?

I will briefly examine the concept of education as a starting point for considering the changes brought about by recent technological advances, particularly those driven by artificial intelligence. Gert Biesta defines three domains of the purpose of education: qualification, socialization, and subjectification. We will use these terms, although there are others (see Biesta, 2020). They should suffice for the scope of this contribution, due to which they must remain somewhat sketched out.

The point of education, says Biesta, "is never that students simply learn – they can do that anywhere, including, nowadays, on the Internet — but that they learn something, that they learn it for a reason, and that they learn it from someone" (Biesta, 2020). *Qualification*, then, involves the transmission of knowledge and skills. Yet this transmission also conveys a particular way of representing the world – that is, it reflects what is generally regarded as valuable. This aspect relates to *socialization*, which involves engaging with traditions and shared cultural practices. And then there is a third dimension, *subjectification*, which, according to Biesta (2000), is "about 'qualified' freedom, that is, freedom integrally connected to our existence as subject. This is never an existence just with and for ourselves, but always an existence in and with the world". We could think of these domains of the purpose of education as being represented by three concentric circles: "where subjectification is either at the centre, because it is 'core', or put in the outer 'ring', because it encompasses the other two domains" (Biesta, 2000).

There is much to be explored regarding the essence of education, the core of what it means to be human, and the potential gap between what a human being *is* and what they *ought to become* through the process of education. I cannot go into the debate about the distinction between *cultivating humanity* and *educating the human* here; however, it is worth noting that the former has proven insufficient insofar as it operates on a pre-given notion of what it means to be human. This idea can take multiple forms and manifestations, several of which do not necessarily align with what we commonsensically regard as human or humane, as the wars of the twentieth and twenty-first centuries demonstrate. These inhumanities, says Biesta (2014), referring to Levinas, "were actually motivated by, if not based upon a specific conception of what it means to be human".

To establish a common denominator, let us assume that education, in this context, means leading the subject (student, pupil) into humanity and being fully human (Snaza, 2013). But does this definition, in light of the recent technological developments, need to be reformed, at least to a certain extent, and if so, how? These actual developments were preceded by various theoretical contributions, famously Donna Haraway with her cyborg imagery (see Haraway, 1991). The explorations of science fiction and speculative fiction should also be mentioned. Several other questions arise from here: what will happen when – if – human stops being human, at least in the sense understood until today? Can education, say, side-track the foundational role of teachers, schools, curricula, etc., in supposedly outdated institutions, contrary to the understanding that authentic education means "pure" *human* relationships between teachers and students (Knox, 2019)?

These dilemmas may not be new, but now an unprecedented player enters the stage: artificial intelligence. True, it brings us various joys and unburdens us from numerous tedious tasks. At the same time, however, it presents significant challenges to various dimensions of our social lives. We should be wary of viewing this entrance as another master narrative. I agree, at least for the time being, that "humanity is encountering what to all intents and purposes we might call a 'period of change' in our relationships with digital technologies, and the social systems and institutions they appear to have become embedded within" (Knox, 2019). That is why it is important to view technology as a factor that actively shapes – and is shaped by – human beings in a process of co-evolution and co-construction, not merely as a tool for accomplishing tasks or achieving goals. This is the way digital technology, developed and used for educational purposes, tends to be understood: as "a supplement or addition, applied with the intention of 'enhancing' existing pedagogical practices or learning experiences" (Knox, 2019). Not enough has been said on "how" the learning can be enhanced, and why this is better.

The use of technology transforms both people and their experiences (Jamison and Haraway, 1992). Digitally transmitted experiences may differ from live experiences, such as human teacher-pupil interactions, in the acquisition of knowledge, social development, or other areas. The reasons for this have already been discussed above in relation to the three domains of the purpose of education. Here is one of the rubs that presents a case for a different conceptualization of education, namely, one that considers the importance of materiality. This is not to say that we should prioritize the use of technology over live experiences, but "pluralize and specify educative practices as materially co-constitutive doings and actions" (Taylor, 2017).

It should be clear that education is no longer a purely human affair, if it ever was (it depends on our understanding of what technology is). Notwithstanding the latter, there is a role that more-than-human and non-human entities play in education. I would opt for the term "posthumanist theory of education", one that "provides a way of thinking of educative practices beyond the limits of cognitive effects, intellectual input and output of 'content', and the effects of human behaviour« (Taylor, 2017). A posthumanist approach to education seeks to move beyond the anthropocentrism we have grown so accustomed to and instead emphasizes the interdependence of humans and nonhumans, including animals, plants, and the environment.

3. AI and the Human Condition

But we are already living in posthumanist (Taylor, 2017) and transhumanist times, some of us enhanced and upgraded through biotechnological interventions such as gene therapy, three-parent embryos, implants, prosthetic devices, and cryonics (well, perhaps not this one yet). We may be thrilled or we may be cautious of all those possibilities, but let us not forget that alongside that, there emerge new hierarchies, in our case, most importantly featuring those whose capacities are enhanced and those who are not "improved" in that way. Who does the choosing about who will get access to the enhancement? It would be naïve to claim that there will be no social inequality in that.

If enhancement technologies were to be used, would different educational standards apply to enhanced versus non-enhanced individuals? We might consider the kinds of experiences each would have, the knowledge they might acquire, and the outcomes they could achieve.

What are the ethical implications? Margaret Atwood, who has done, by the way, a lot of this kind of thinking in her novels, has posed two questions that perhaps capture all the dilemmas in a nutshell (Atwood, 2011): "How far can we stretch and still remain human? What is essential to our being, what is contingent?" And there are no easy answers to that, as what might be at stake is our identity and our – that is, human – authenticity.

To address some of these very pertinent dilemmas, I offer the following lines of thought that do not lead either to unproductive technophobia or uncritical euphoria. It might be time to reconsider the categories, concepts, and language, especially in the context of AI-related matters. Since AI has not been with us for very long, it remains to be seen how the suggested reconsiderations will take place.

I suggest two moves to start with, but no doubt different steps are possible: (1) a move away from anthropocentrism, both in language and concepts, (a) to include non-human entities and (b) to name the hereto unknown and "unconceptualizable" phenomena, and (2) a move away from thinking about AI as merely automaton and task substitution agent, and from "injecting" AI (Susskind, 2025) into the current ways of going about our business.

What if, since we are in slight conceptual trouble here with the first move, we try a different approach to language and naming things, as suggested by Susskind (2025)? He proposes that we do not use the terms we are comfortable with when applying to humans, but invent new ones that would enable us to distinguish between human and machine procedures. The solution he proposes is somewhat awkward, but my argument is not about this particular solution, but about making a distinction between human and machine processes whose outcomes are seemingly similar. It is indeed "hard not to want to use human labels to describe what's going on when machines deliver outputs that we thought were the exclusive product of biological people" (Susskind, 2025). Susskind's proposed solution is adding *quasi* (Latin for "as if") as a premodifier. So, we would have a quasi-education, quasi-judging system, etc. I think this approach presents challenges both in practice and in theory. But the point is: would this distinction clarify the issue sufficiently? Is "clean" education, that is, untainted by technology, even possible?

If making this distinction seems unnecessary or ridiculous, let us bring to mind the verb "to think". We do use it indiscriminately for both humans and AI, but we (all) do not think that AI thinks, at least not just yet, and not in a sense humans do. To clarify that we would be required to have a serious excursion into what conscience is.

The thinking that calls for a second move is also very prevalent and hence almost invisible. Its background is the perception of technology as a tool that can be used wherever necessary or fitting. Relatedly, there is the persistent separation "of an authentic inner 'humanness' from external and alien 'technology'. The project of education is overwhelmingly viewed as a matter of human development, whether in the form of individual behaviours, cognitive processes, or social constructions, in which technology only features in a supporting role, typically as an uncritical 'enhancement' for learning" (Knox, 2019).

In other words, in education, we use AI to make it better, perhaps even more fun, but the background thinking is that AI replicates humans' (in our case, teachers') work. This replication is considered good should we reach that point in the development of AI, and, at the same time, bad because this would endanger the position of the teachers and render them obsolete. Susskind (2025) calls this AI fallacy, which is "the mistaken assumption that the only way to get machines to perform at the level of the best human is somehow to replicate the way humans work". However, AI functions differently from humans, although the results may seem the same or similar. The basic error, says Susskind (2025), is that we do not recognize "that AI systems do not mimic or replicate human reasoning. To think otherwise is to take a much too human-centric view of AI".

There is anxiety about AI systems outperforming humans or doing things that are beyond human capabilities. On a larger scale, it seems that less anxiety is caused by the use of machines that outdo humans in heavy work (say, moving burdens, building houses) or microscopic work (say, entering into the human body) than by the use of machines that outdo humans in activities that call upon our intellect (Susskind, 2025). In both former cases, the machines could be thought of as human extensions, but in the latter case, the discomfort is seen as imminent as the machines, with their human-induced mastery, are entering into our most private domain.

However, nonhuman systems are not (yet) analogues for human minds. I cannot go into details about the complex issue of what intelligence is, nor am I in any way equipped to talk about it at length, let me point out that human or biological intelligence cannot be made up from scratch, "without addressing the fundamental ways in which humans are embodied, relational and set within wider ecologies" (Crawford, 2021). By embodiment, I do not mean AI-driven machines interacting with the physical environment, with, e.g., sensors

or "learning" physical concepts to be better able to function in a spatial dimension. I would suggest, following Karen Barad's work here, thinking in terms of "entangled elements" that co-constitute each other.

Co-constitution also means thinking in a distinct step away from the Cartesian dualism or split of the body and mind. The split implies the assumption that cognition can be studied in isolation, with no links to physical substrates (see e.g. Barrett and Stout, 2024). This line of thought also aligns with the concept of embodied cognition, which is highly relevant not only to AI research but also to broader debates surrounding human and biological consciousness.

But I want to stress the following. Human intelligence does not exist independently, as distinct from all the social, cultural, political, and historical forces (Crawford, 2021). Taking this into account, we can see that there cannot be enough common ground to compare us to the AI in this regard. True, there might be opposing opinions regarding the simulation of embodiment, environment, even history and culture, etc. This takes us in the direction of questioning the reality as we commonsensically know it, but let us stick to the notion of reality we currently agree upon, *our* reality.

The use of technology allows us to "enhance" our capabilities, our biology, which is, in fact, a dynamic that has existed throughout human history. We have long extended our visual apparatus through microscopes and telescopes, which make previously inaccessible aspects of reality available for observation. More recently, biotechnology has opened up new possibilities for enhancing both body and mind, allowing us to go far beyond what our biology permits us. Sometimes these interventions help us stay the way we were, so they are in function of "correcting" the damage done to us by illnesses or accidents and are, in this sense, beneficial. This raises the issue of how to distinguish between therapy and enhancement, and where to draw the boundary between the two. I am, of course, aware that this is a huge simplification of the topic.

In the same domain, we can include the development of "personalized" (or perhaps more accurately, "customized") learning systems that supposedly tailor educational experiences to the use of data. Interestingly, these systems are being developed by social media giants and corporations (see e.g., Knox, 2019). Customized learning and teaching are needed in pedagogical processes, and students should get as much learning support as possible. But in this new version, the data is doing the deciding, what should be offered to whom, not the teachers, and then there is the question of who is doing the grading of the students' results.

This brings us back to the role of teachers in an era of digitalization – a role that risks being reduced to that of mere facilitators, while education itself becomes a diluted system that overlooks its essential features and fundamental nature, including the vital role of social interaction in the learning process. Besides, another major inequality appears here: a distinction between those whose intellectual, sensory, and physical capacities have been boosted and those who are digitally unenhanced (Susskind, 2025). This is, therefore, also a matter of fair (or equitable) distribution. This said, there is an absolute need "to question the forces that are driving that narrative" (Herold, 2017).

4. Conclusion: Our Common Future

It might well be said that it is counterproductive to view modern technology as a threat. Besides, we have seen it before; let me mention the entrance of television into our everyday lives that would supposedly endanger reading. Nor is it a final accomplishment that will help solve all our troubles and problems, be they educational or others. Here lies the task of critical posthumanism: to try to navigate between the mirrored antitheses of discomfort and euphoria (Zefelius Igrek, 2015), to challenge common-sense ideas about the progress of technology and responses that either enthusiastically embrace futuristic technological enhancement of our world and ourselves in it or show a desire for a sentimental return to a more "natural" existence, as if that would be possible (Knox, 2019).

When we venture into the terrain of polarization, all the complexity is lost, together with the understanding that this is, in the final resort, about our societies and societal issues that need to be addressed, not really about machines. To put it in another way, AI and other modern technologies are not a purely technical domain: AI systems "both reflect and produce social relations and understandings of the world" (Crawford, 2021).

This is a multi-layered territory, raising numerous questions about both AI and society more broadly. What is more, and the awareness of which is somewhat surprisingly put backstage: there will be questions that we are not able to conceive today and not able to imagine, related to problems that have not yet arisen (Susskind, 2025). In short, we do not know what might happen. "The future of schooling and education might not lie in the AI version of what we have today, but in entirely new approaches" (Susskind, 2025) that we do not know much

about at this point. What we do know is that we witness "material and discursive manifestations of the mutations engendered by technological developments, climate change, and capitalism" (Braidotti, 2019).

That is why the work on the theory of education that reaches beyond anthropocentrism, understands the posthuman condition of our historical time, and considers the interdependence of human and non-human actors is of vital importance.

Acknowledgement

This contribution is a research result of the projects, financed by the Slovenian Research and Innovation Agency (ARIS): N5-0272, Education at the Frontiers of the Human: The Challenge of New Technologies (EDUCAT(H)UM); and P5-0106 Educational Research.

Ethics Declaration: The preparation of this paper required no ethical clearance. The research presented is theoretical in scope and did not involve cooperation from human or animal subjects.

AI Declaration: No AI-assisted technology was used in writing this contribution, except for language editing.

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