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Five Theses on (Dis)Comfort in the Educational Cultures of Digitality

Abstract

In many current discussions, digitalization functions as a dazzling leitmotif not only for technological, social and cultural transformation processes in general, but also for current social reproduction problems and upheavals in the field of education in particular. On the one hand, there is a widespread uneasiness in educational cultures of digitality; on the other hand, the promises of the future in learning technology are also promoting tendencies of ease for some groups. Based on a broader perspective that goes beyond a Freudian understanding of discomfort in culture, this article puts forward five trenchant theses for discussion, all of which mark fault lines of (dis)comfort in the educational cultures of digitality.

K e y w o r d s: educational culture, digitalization, technological solutionism, rhetoric of digitalization, machine learning, robotics

1. Introduction

The digitalization of (almost) all areas of life has been the central starting point for countless everyday practical, economic, political and scientific considerations and initiatives for several years. The term 'digitalization' is comparatively rarely

restricted to technical processes in the narrower sense, which focuses on aspects of modeling, formalization and algorithmization for the purpose of creating, processing and storing digital representations. Very often, a very broad concept of digitalization is used, referring to all dynamics of change that can be directly or indirectly related to the spread and increasing use of digital technology systems. In recent times, the exploitation of increasing amounts of data, machine learning and systems based on artificial intelligence (AI) have become particularly significant. The vagueness of the term 'digitalization' plays a role, not least in highly endowed funding programs, insofar as the bulk of the funding is used for technological disciplines, market-oriented application research, engineering patterns of thought, and disposal-rationalistic approaches to problem solving. For disciplines that do not subordinate their problems and the basic orientations to this "paradogma" of digitalization, there remain – unless they are already being treated as discontinued models of the so-called Gutenberg galaxy – a few hopelessly inadequate funding pools and niches for a more or less precarious independent research.

The belief that non-technological problems can also be solved efficiently and sustainably with digital-technological means and methods goes hand in hand with a shift in the attribution of responsibilities: In "technological solutionism" (cf. Morozov, 2014; Nachtwey & Seidl, 2017), questions on the organization of the digital essentially mutate into problematic issues of applied computer science, whose mainstream corresponds unbrokenly with digital capitalism. Theoretical differentiations, as well as disciplinary and terminological demarcations are losing their importance. Differentiated definitions of the relationships between the dynamics of digitalization, mechanization, algorithmization, automation, datafication, medialization, mediatization, mathematization, economization, optimization, pedagogization or robotization are superfluous in solutionist discourse contexts.

Digitalization in the twenty-first century has also become, among other things, a pedagogization formula (Veith, 2003). Calls for the "digitalization of education" are currently being voiced from many sides, and they are certainly receiving attention in current educational policy programs. For example, while the strategy paper of the German Conference of Ministers of Education and Cultural Affairs (2016) avoids expressions such as "digital education" and "digital competencies," the Austrian "Master Plan for Digitalization" (BMBWF, 2018), with its focus on "basic digital education," aims to "gradually and, above all, comprehensively incorporate changes resulting from advancing digitalization into the Austrian education system" (ibid.). Both documents assume an instrumentalist concept of media, ignoring media-cultural contexts. In both documents, the purpose-oriented use of digital educational media, as well as instrumental and functional perspectives on curricular developments, instructional development, infrastructure topics,

continuing education and training, as well as learning management systems and service portals play a central role.

The heroic gesture that is expressed above all in the idea of a "master plan" may already give rise to unease. However, the focus on digitalization as a guiding formula for technological, social and cultural transformation processes in general and for current social reproduction problems in the field of education in particular gives rise to unease in many more respects. In the following, we will explore and reflect on some of the desiderata that follow from the hype about digitalization in education. These are presented for discussion in the form of five pointed theses.

2. Preliminary Considerations for an Expanded Understanding of (Dis)Comfort

In his work "Civilization and Its Discontents" from 1930, Sigmund Freud (1930/1997) considers essential areas of tension between drive and civilization, or culture. He explores the contradictions between the individual pursuit of liberty and happiness and cultural norms of denying urges, as well as various forms of libidinal development restricted by civilization. On the one hand, civilization offers safety and protection from the internal and external (disease, death) and from hostile relationships; on the other hand, it requires drive renunciation and a compulsion to work and contributes to the emergence of feelings of guilt, for instance when authoritarian demands are adopted. In this situation, there are limited possibilities to replace the pleasure principle for the reality principle, by influencing the internal and external sources of displeasure and thus partly avoiding the sentiment.

However, culture always remains a source of suffering, and its development inevitably leads to widespread discontent. Some recent works propose a discomfort *at* culture (e.g., Schneider & Sexl, 2015) or *with* culture (e.g., Müller, 2003). I am not aware that the use of these expressions has been conventionalized. Such a process could be developed along the following emphases: *in* culture in the sense of an abstracting perspective on inevitable constitutive contexts of reference (individuals/actants vs. society/culture) and affect-logic dynamics of discomfort; *at* culture in the sense of an abstracting perspective on individuals and their discontent over social problems and cultural developments; *with* culture in the sense of a reconstruction of individuals' discontent over specific cultural phenomena.

Among the institutions which can make growing into civilization possible, and occasionally quite (un)comfortable, for subsequent generations are also educational

institutions. In his contribution "Das Unbehagen in der Bildungskultur" (2010), Helmwart Hierdeis analyzes a number of areas of tension which are intensified by tendencies of privatization, economization and the technocratic regulation of the education system. Building on this contribution, I want to focus on a few current developments which foster discomfort in the educational cultures of digitality while for some groups and businesses they rather represent tendencies of ease.

The expression "educational cultures of digitality" refers to the educationally relevant subprograms of cultural programs (Schmidt, 2015, pp. 22–30) in historic-medial constellations in which mediality is significantly (co-)constituted by interlinked digital technologies, cooperation between human and non-human actors, and the interconnection of material and immaterial dimensions. These subprograms enable educational processes and related orientation efforts, the schematization of corresponding options on micro-, meso- and macrolevels, and the justification of models for en-/decoding and evaluating education results.

The application of the subprograms, like that of cultural programs as a whole, does not occur in a power-free space. Instead, competing claims of power and the dynamics of a "coexistence, cooperation and confrontation of processes of dissolution and constitution" (Stalder, 2016, p. 17) play a crucial role. Among the politically relevant guiding questions are the following: "Who in a society develops the power to define or even command over what categories and differentiations? Which reputation, which power and accordingly which sanctions are connected to such authorities? […] Which biases do certain areas of differentiation have and how changeable are they? […] Which coercive character do certain options develop? […]" (Schmidt, 2015, pp. 25–26). With a view to the "tectonics" of the dynamics of cultural programs, the conflicting tendencies of stabilization and change, and the upheavals in education and media cultures, it becomes clear that phenomena of (dis)comfort are far from evenly distributed in society. Some protagonists who have set themselves up quite "comfortably" in the current educational systems may feel discomfort considering the ongoing digitalization programs in the field of education. For others, the thought of education and culture may lead to associations like resistance to reform, unequal opportunity, outdated administrative structures, or the "glory and misery of a German interpretive model" (Bollenbeck, 1996), so they may see little cause for comfort in the face of the medial change and global challenges. Still others develop discontent at the idea of education-related expectations of normality in which robots, automatized scoring systems and the business models of the global education industry represent integral parts of public education.

No matter how comfort and discomfort relate to each other and how they are distributed socially in the entirety of the interlinked subprograms and with a view to individuals and social groups, it is never only about rational considerations, but

about complex, affect-logical dynamics (cf. Ciompi & Ender, 2011). Very emotional or affect-laden articulations, as well as such that are highly abstract, "purely" rational or intended to be free of purpose are part of these dynamics and thus of the (dis)comfort in culture. Interdependences between affective moods and cognitive patterns may be found both on individual and collective levels. The "affective-cognitive personal worlds (or 'mentalities,' 'ideologies') specific to personalities, groups or cultures, organized by certain lead affects and continuously validating and strengthening themselves" (Ciompi & Ender, 2011, p. 13) correspond to the different forms of (dis)comfort. To the degree that models of reality and cultural programs co-emerge and constitute a mutual interdependence, the specificity of these interdependences lies in "*how* the categories and differentiations of the model of reality are semantically put in relation, affectively assessed and morally connoted by the cultural program, so that they can serve as a precondition (orientation of meaning) for positings (distinctions that are made, actions in the broad sense)" (Schmidt, 2015, p. 24; italics in original).

In this expanded perspective, questions regarding the discomfort in culture do not only concern human libidinousness and the restriction of the gratification of sexual and aggressive drives through culture. They are also connected to existential problems and precarious situations, different degrees of individual or organizational learning ability, shifts in relational and power structures, and controversial allocations of responsibility and different moral assessments in media-cultural constellations.

3. Five Theses on (Dis)Comfort
in the Educational Cultures of Digitality

This is the background against which the following five theses will be outlined, all of which mark fault lines of (dis)comfort in the educational cultures of digitality. Depending on social affiliation, political orientation and economic situation, they tend to function as sources of either comfort or discomfort.

Thesis 1: Casual ways of using terms and the smart rhetoric of digitalization are highly influential and widespread in the context of educational planning and the development of schools and universities

The rhetoric of ICT in the field of education is nothing new (cf. Haugsbakk & Nordkvelle, 2007; Haugsbakk, 2020). Since at least the educational promises

of the early e-learning developments, it has become clear that linguistic accuracy and theoretical differentiation are still relevant at best for small groups in academia, which to this day are habitually accused of being out of touch and overly theoretical – as if *any* media-pedagogical research, regardless of its orientation on pedagogy, educational science, media studies or communication studies, should focus on forms of applied research whose results can be brought to fruition in diverse everyday or work-related situations, without much effort for translating or concretizing them. Of course, the same holds true for those interdisciplinary orientations which also refer to concepts and models from computer science, psychology or sociology.

From "electronic learning" to "intelligent systems" and "machine learning" to "School 4.0" and "digital literacy," there is no shortage of abbreviated and metaphorical ways of expression which, on the one hand, attribute technical features to non-technical phenomena or, on the other, claim human-like "intelligences" and decision-making abilities for technical systems. There is certainly sporadic criticism of the superficial use of terms and of the different varieties of "web speak" or "tech speak" in education (cf. for example Dander, 2020, pp. 20–21; Niesyto, 2021, p. 3; Reichenbach, 2016; Selwyn, 2015). However, this criticism is not taken seriously, if it is noticed at all, by the protagonists at those junctures where the announcements of education-political digitalization programs or university plans to develop the digitalization of teaching can barely be distinguished from promotional content coming from the education industry. And in those areas where the casual use of terms and the smart rhetoric of digitalization are prerequisites for receiving grants and awards, they represent, at least for some groups, a source of comfort – regardless of whether this concerns the funding of applied research, for example on the MOOCification of education offers, or the development of school- or lesson-related apps.

As for MOOCs, there is a wide range of conceptions. In the most general sense, this means transforming a traditional or internet-based offer of lectures or seminars into a range of "open" online courses for large numbers of participants. The expression MOOC, an acronym for Massive Open Online Course, was coined by Dave Cormier in 2008. At the time, Stephen Downes and George Siemens taught a student-centered course on "Connectivism and Connective Knowledge" at the University of Manitoba in Canada, with around 25 participants on-site and over 2,200 students taking part in structured online discussions and meetings, as well as via blog posts. The connectivist orientations were subsequently indicated by the abbreviation cMOOCs (connectivist MOOCs). Depending on the intended type of Massive Open Online Course (MOOC) and the respective background – influenced by learning technology, media didactics, the education industry and commercial interests –, concepts and practices of MOOCification can take on

many forms today. Common abbreviations include xMOOCs (extended MOOCs), bMOOCs (blended MOOCs), mMOOCs (meta, mobile or mini MOOCs), qMOOCs (qualification MOOCs), tMOOCs (transfer MOOCs) and vMOOCs (vocational MOOCs).

As for an Austrian example of apps, see the award-winning "all-in-one school-app" from Young Enterprises Media GmbH (https://foxeducation.com/schoolfox/ and https://www.a1.net/marketplace-schoolfox), which is promoted by the Austrian Education Ministry (see https://www.bmbwf.gv.at/Themen/schule/beratung/ corona/corona_fl/komlm.html) and was awarded a BigBrotherAward in 2016 (https://de.wikipedia.org/wiki/Big_Brother_Awards#2016_2, http://www.big-brotherawards.at/2016/marketing_2.php, http://www.bigbrotherawards.at/2016/ marketing_2.01.php).

Whenever concepts such as "digital competencies," "digital learning," "virtual literacy," "Learning 4.0," "on-demand learning" or "byte-sized learning" are mentioned, this does not only illustrate tendencies of "learnification" (Biesta, 2010) and shifts in regard to pedagogical responsibilities (Biesta, 2011, p. 190; Friesen, 2019). Likewise, these references do not simply represent reductions to technical dimensions and technological know-how, or a primacy of affirmative qualification in the service of economic interests and growth ideologies. Going beyond all of that, we are dealing with questions on the context-driven development of education and science at large and with nothing less than reflecting on and clarifying, firstly, interdependences of the educational and scientific system in relation to the societal subsystems of economy and politics in liberal democracies, and also spaces for autonomy in the public institutions of education and science.

Thesis 2: Operative fictions of optimizing processes of learning and education correspond with poorly reflected assumptions of mathematization and of the computability of the world

Notions of optimizing processes and methods to quantify the self and others are not inventions of the digital age. From choosing a lubricant for the first rotating fixed wheels to choosing efficient neural networks in machine-learning programs, narratives and leitmotifs of optimization have been diversified and developed. An end to these traditions is not in sight, on the contrary: Computer network technologies have made available processing capacities without which developments in structural sciences and their manifold technological applications would not have been possible.

The frictions between encultured medial constellations of the twentieth century and the emerging new socio-technical configurations of the twenty-first century also affect the key topics of education, especially growing up, learning and teaching. The "optimizing spirit" (Leineweber & Wunder, 2021) that pervades the

rhetoric of digitalization makes some people hope for a chance to overcome the "technological deficiency" (Luhmann & Schorr, 1982) and others worry in view of certain fuzzy ideas of applying rational measurement models to the data-driven management of learning and development processes. No matter if a narrow or broad concept of technology is taken as a starting point, or if referring to a technological deficiency is generally deemed to be out-of-place or misleading with respect to the postulates of human dignity and the development of autonomy: The increasingly refined and partly automated measuring methods open up widened scopes of calculating, monitoring, manipulating and controlling, up to re-educating entire population groups.

These enhanced and sometimes de-limited scopes at the interfaces of quantitative-empirical education research, education policy and education economy may prove of value in some regards as "operative fictions" (Schmidt, 2006, p. 4). On the other hand, in the course of becoming reality, the fantasies of optimization occasionally mutate into paradoxes of optimization (Wolf & Thiersch, 2021) – not least when the polymorphism of pedagogical "logics" is consistently interpreted and assessed in the light of machine-, market- or media logics and the self-similarity of the process dynamics does not come into view anymore. The tendencies towards rationalism of disposition are not linked to a particular rationality or version of rationalism. They concern all forms of rationalism, which characteristically tend to absolutize the determination of starting positions, assessment modalities, means, purpose, or procedures and authorities for the deliberate production of behaviors or specific circumstances (cf. Hug et al., 2007). To what an extent the algorithmic rationality opens up new scopes in this context cannot be answered at this point. The discussion of "generative realities" (Löffler, 2019) as calculated, predictable and controlled realities has only just begun.

Such tendencies can be found in the algorithm-based timing of learning technology and the AI-based production of specific qualification effects. They do not only run counter to the obstinacy of open-ended educational processes. They also contradict education-related uncertainty principles. Furthermore, they correspond with ideas that processes of learning and communication are predictable on the basis of calculations and formally schematized competency elements, without consistently considering the human capacities to differentiate between sense and nonsense, to spontaneously depart from rules in the action process, and to creatively connect *Phantasie und Kalkül* (Schneider, 1992). And what is more, a discomfort with the optimization discourses stems from these discourses' lack of reflection when it comes to the limits of mathematical languages (Frey, 1967), algorithmic rationality (Mersch, 2019), and the computability of the world (Pietsch et al., 2017).

Thesis 3: Misleading metaphors in the approach to AI and robotics contribute more to spreading disorientation and uncertainty than to elucidation

Ever since Haugeland (1985) coined the expression "Good Old-Fashioned AI" (GOFAI), several new approaches have been developed which are concerned with the automation of "intelligent" behavior and machine "learning." In contrast to the top-down programming for specific areas of application on the basis of stored facts and if-then statements, the more recent bottom-up approaches rely on the programming of neural networks and the "learning ability" of technical systems. The technological and commercial breakthroughs achieved with the symbolic AI in the 1980s using expert systems appear extremely modest in comparison with the breakthroughs of neural AI, which mainly operates on the methods of machine learning, deep learning and reinforcement learning. The same applies to "Good Old-Fashioned Robotics" (GOFR) and the developments of WABOT-1, the robot cars of the 1980s, Atlas by Boston Dynamics/Softbank, Sophia by Hanson Robotics, and the countless industrial applications on the basis of intelligent technologies and materials.

Some AI-based technologies, such as commercial language assistance and dialogue systems (for instance Google Assistant, Siri and Alexa) have become popular parts of everyday life in the affluent parts of the world, and depending on the geographical region, robots for cooking, mowing and vacuuming, as well as entertainment robots such as Aibo have been made available. The name for this development by Sony, whose first model ERS 110 was already offered more than twenty years ago, refers to the Japanese word for "partner," on the one hand, and the abbreviation for **A**rtificial **I**ntelligence ro**BO**t, on the other.

Furthermore, there are therapy robots such as Paro, nursing robots such as Terapio or sex robots like Roxxxy, all of which have become familiar sights. In education, the use of robots (cf. for example Lepuschitz et al., 2021) and learning bots – typically in the form of chatbot applications which are specifically programmed for processes of learning and teaching – as well as the application of learning analytics and different types of AI-based adaptive learning environments are currently being intensively tested and developed. These range from well-known flashcard systems to algorithm-based training apps to adaptive learning platforms and tutoring systems. Based on calibrated data models and granularly organized learning and teaching contents, they help shape and control the processes of learning and teaching in a personalized way by means of formative evaluations in regard to subgoals.

This process entails the articulation, explicitly and implicitly, of more or less far-reaching claims of supporting learning processes in an interactive, intelligent and individualized way, and corresponding promises for the future of learning technology.

These promises tie in with well-known machine dreams and historical discourses between the poles of human machines and mechanical humans (Wittig, 1997), which are revived time and again with reference to technological breakthroughs and achievements, as well as through metaphorical expressions. From the metaphorical use of basic terms like "intelligence," "learning," "knowledge" or "communication" to the description of robots as "friend," "study buddy," "coach" or "teaching assistant," countless metaphors are in use (see, for example, https://www.softbankrobotics.com/emea/en/pepper-and-nao-robots-education, https://www.eliasrobot.com/ and https://www.eliasrobot.com/post/elias-robot-for-distance-learning). These metaphors can, depending on the media-cultural context and the social situation of the recipients, raise hopes for increased education equality, flexible lifelong learning or overcoming certain Eurocentric concepts of education, or they tend to trigger fears given the idea of increasingly "smart" learning environments or the idea of AI applications and robots as "full-fledged" protagonists in society making autonomous decisions.

The multiple compatibility of the metaphorical expressions in regard to different application contexts and affirmative and critical discourses boosts not only the highly profitable business with AI applications, but also the spread of images of "digital integration" or inclusion and sociotechnical cohesion. In contrast to the hitherto "cold" machines, the focus is now on the empathic assistance and supervision of processes of learning and communication, as well as on assumptions of "mechanical" responsibility and capacity to act due to a human-like social, emotional and moral intelligence. Many of the individual metaphors can be combined in the metaphorical concept of "artificial companion" (Pfadenhauer, 2018). On the one hand, this opens up illuminating perspectives on fruitful interdependences between partially autonomous humans and machines and on the claim of uncomplicated relationships and pragmatic solutions for human needs which connect humanity, human dignity and versatile algorithmic functionality. On the other hand, the metaphorical concept also contributes to the concealment of perspectives. This concerns the *pars pro toto* character of the contexts of the description, the insufficiently complex approach to questions of responsibility and allocation of responsibility, the industrial and politico-economic interests in rich countries and not least, the "forgotten" experiential contexts which have more to do with artificial stupidity (Ennals, 2016; Falk, 2021) and artificial intimacy (Turkle, 2021) than with artificial intelligence. What is more, the metaphors used in AI and robotics contexts consistently "do something" on their own, so to speak, and are not simply of the conceptual or orienting kind which are processed cognitively, socio-culturally or physically. In this connection, Marianne van den Boomen (2014), following the concept of "material metaphor" (Hayles, 2002), refers to "transcoding metaphors"

which function as translation media between cultural and digital codes. Depending on the context in which they are used, they add considerably to (dis)comfort in the cultures of digitality, but barely to the elucidation of relevant functional contexts and development perspectives.

Thesis 4: In the educational measurement sector, orientations on the common good and sustainability play a minor role

Critical considerations on the commercialization and economization of education may figure significantly in academic discourses (cf. for example Lith, 1985; Reheis, 2004; Radtke, 2009), but not in processes of decision-making in educational policy. Since at least the 1990s, the increasing differentiation and dispersion of practices that quantify and assess "education" have gone hand in hand with an emerging measurement sector whose complexity can easily bear comparison to geodesy. This internationally connected measurement industry is prominently involved in establishing a changed educational setting and global educational governance. The priority held by an orientation on competency and output in the cooperation of education research, education policy and education practice (cf. Kemethofer et al., 2021) is just as conspicuous as the claims of improved quality, increased efficiency and enhanced employability and competitiveness, which are supposed to be "implemented" by means of standardized benchmarks, comparative assessment, new public management, appropriate laws and improved leeway for private enterprise.

To say nothing of the presumptuousness which characterizes some approaches to quantitative-empirical educational research with regard to qualitative-empirical and theoretically motivated studies in education, there is inadequate attention throughout on the limitations of the notably promoted quantification industry, the concurrent fictions of control, and the unintended results the standardization efforts have on micro-, meso- and macro-levels. The mainstream of the educational measurement sector shows a high appreciation for the processes of value creation made possible by digital technologies and the "digital climate change." Welfare orientations matter only secondarily if they come into view at all. The same is true for the elucidating potentials of the ecological paradigms of economy (cf. Common & Stagl, 2007) and critical sustainability research (cf. Blühdorn et al., 2020) for education research and education policy. The rhetoric of sustainability in education policy has been contrasting for decades with the educational policies of non-sustainability, and this has not changed in the digital age of accelerated development in media culture.

The digitalization initiatives in education go hand in hand with developments in the education industry, whose relevance is not consistently accounted for when

it comes to weighing up the cost and value of education (cf. for example Binder & Drerup, 2020). Even if it is inadequate to express across-the-board criticism of da-ta-positivist tendencies in the sense of a "reactionary education-positivism" (Hey-dorn, 1980, p. 58) in digitalization when we consider available education resources, open source developments in the area of education and post-digital educational cultures of sharing, in recent years we have seen the emergence of globally con-nected development dynamics essentially characterized by an education-industrial complex (Münch, 2018) which – just like the global education industry as a whole (cf. Verger et al., 2016) – has been researched only rudimentarily. The varied efforts of the "education-industrial complex" (EIC; Picciano, 1994) to influence differ-ent education sectors in numerous countries coincide with a non-transparent data economy and a multitude of new business models in digital capitalism. Whenever "common good" and "sustainability" are mentioned in this context, we are dealing with greenwashing and subordinated orientation marks, but not with the overcom-ing of non-sustainable educational systems, knowledge economies or lifestyles. The question as to what an extent the coming into effect of the draft of a "general data use regulation" (European Commission, 2020a) facilitates sustainable solu-tions in European education systems, or whether it needs to be seen primarily in the context of policies of non-sustainability, has to remain unanswered.

Thesis 5: Open questions concerning the distribution of responsibility in co-evolutionary human-machine constellations belong to the set of crucial challenges for education research and education practice

In contrast to the open concept of cultural programs (Schmidt, 2015) mentioned at the beginning, some learning-technological positions regard culture as a set of algorithms which allows programming the behavior of everyone participating in the cultural processes (cf. Kulikov & Shirokova, 2021, p. 316): "This type of pro-gramming involves collecting and processing data in the same way that computing machines act. In addition, cultural programs work independently from people's intentions" (ibid.). Such techno-deterministic approaches clearly aim at overcom-ing humanistic traditions of subject-oriented human education (Wiersing, 2001). Then, the question *Should Robots Replace Teachers?* (Selwyn, 2019) is no longer a rhetorical question that prompts a differentiated discussion of human-machine-constellations.

On the other hand, and regardless of the many technological breakthroughs in some areas, no robot and no AI have so far exhibited the ability to universalize their own decisions in the Kantian sense. Neither would the intelligent systems known today pass the "Kant-Test" (Leschke, 2018, p. 93). The lack of normative fundamentals and the incapability for reason in automatized systems also represent

the core arguments made for digital humanism (Nida-Rümelin & Weidenfeld, 2018) and the *Wiener Manifest für Digitalen Humanismus* (Werthner et al., 2019). The recently published declaration of the United Nations (2021) on children's rights in digital environments is also based on similar arguments. The same counts for humane forms of developing human-centered digital technologies as, for example, the recently published declaration of the United Nations (2021) on children's rights in digital environments shows.

As far as issues of media education and media socialization are concerned, these approaches emphasize the goals of media empowerment and the ability to participate critically and reflexively (Boeckmann et al., 1992; Missomelius, 2021; Simanowski, 2018, pp. 198–199), as opposed to the prevalent demands to increasingly promote market-oriented "digital" competencies and technical skills.

However, this does not answer important questions of assigning responsibility in transversally connected media systems. To be sure, the need to develop ethical guidelines for using AI in the contexts of teaching and learning is addressed in the *Digital Education Action Plan 2021–2027* (European Commission 2020b, p. 16). Yet this plan does not outline *how* responsibility could or should be distributed in the pursued "partnerships between educators, the private sector, researchers, municipalities, and public authorities" (ibid., p. 8) in regard to the goal "to make high quality, accessible and inclusive digital education a reality for all" (ibid.).

In the current co-evolutionary human-machine constellations (Faßler, 2011; Lee, 2019), there emerge scopes for development, design and action which go beyond established forms of dialogic or collaborative co-creativity (cf. for example Cizek et al., 2019). There are largely no final answers to questions on how accountability is distributed in the cooperation of partly autonomous humans and machines, which rules and values are relevant, whose authority can hold accountable those who are involved, and which consequences are at stake. What is clear is that questions concerning the attribution of responsibility cannot be adequately answered within the framework of instrumental perspectives and the educational promises of technology (cf. Mansell, 2018). It is equally clear that, considering the co-creative rooms for maneuver and socio-technical processes, a number of scenarios and development perspectives are possible for the education system, and not only the path of innovation that is presented as the only option by the global education industry.

4. Conclusion

Nowadays, digitalization, datafication, AI applications and large data analyses give in many respects both cause for concern, especially as to tendencies of commodification, commercialization, trivialization and privatization, as well as cause for optimism regarding the co-creative advancement and innovative design of educational processes (cf. Beetham & Sharpe, 2020). Although the ICT rhetoric mentioned in the beginning misses the point when it comes to many pedagogical and didactic standards, differentiations in education theory and ideas of the primacy of pedagogy in education, it certainly has not missed out "at school" (Kabaum & Anders, 2020). There it plays a considerable role, not only directly due to digitalization programs in education and the COVID-19-induced development bursts in the global education industry (Williamson & Hogan, 2020), but also indirectly through the enculturation dynamics in the context of digital technologies, the medialization of 'lifeworlds' and not least through processes of "involuntary mediatization" (Adolf, 2014).

The pointed theses mark several fault lines of (dis)comfort in the educational cultures of digitality in an exemplary fashion. It would be possible to argue for additional fault lines: for example, along the various dynamics of physical, technological, social and cognitive mobility; at the interfaces of (post)democracy, techno-feudalism and political media literacy; in regard to medial dynamics of inclusion and exclusion; in the context of the different types of massive open online courses (MOOCs); regarding diverse concepts of virtuality and their application in the field of education; or in view of pedagogical-practical applications of behavioral genetics (Kovas et al., 2016). Related arguments are discussed in the contributions of the edited volume on *The Digital Age and Its Discontents* (Stocchetti, 2020). In all cases it can be made evident that the respective fields of phenomena tend to function as sources of comfort or discomfort, depending on the social field and economic situation, pedagogical and political orientation, and media-cultural affiliation.

Thus, (dis)comfort remains ambivalent and inhomogeneously distributed: Some see (media) education and media pedagogy as a whole – or at least its critical and theoretically more ambitious variants – "at the end of their era" and take no significant issue with either "ed-tech speak" or with preferentially considering topics of learning, education, social participation or enculturation in historic-medial contexts to be part of the field of applied information science. Others indicate sources of discomfort in superficial or the biasedly stinted manners of discussing these topics, in the tendency of universities becoming more like universities of

applied science, in the consequences of power-politically cushioned interpretive authorities in the context of grant programs (Altenrath et al., 2020), and in the unilaterally resolved paradoxes of useless usefulness and useful uselessness (Hug et al., 2007).

When the resistance of the well-educated and the intrinsic value of educational processes that are conceived to be free of purpose do not have an effect anymore, there is not only a higher cost of education in the form of social, political and economic follow-up costs but also, decreasing chances for permanently successful processes of transformation.

There is no sound reason to invisibilize the contingency of the medial and digital transformation processes and instead focus on industrially prefabricated paths of innovation. The disciplines of the humanities, social studies and cultural studies can make significant contributions to the differentiated understanding of the manifold interconnections between analog and digital, and point out correspondingly diverse options for design and development. Such contributions concern not least the confluence of analog and digital dimensions as described, for example, in the context of post-digital practices (cf. Bishop et al., 2017; Cramer, 2015), the significance of a typology of "generative realities" (Löffler, 2019) and design theory (cf. Krippendorff, 2011) for educational research and theories of *Bildung* (cf. Siljander et al., 2012), creative linkages between imagination and calculation (cf. Schneider, 1996), as well as the conceptualizations and ethical deliberations regarding options for co-creation in the context of collective media practices that involve humans and non-human systems (cf. Cizek et al., 2019). As for examples and options for design and development beyond industrial or reductionist techno-bureaucratic perspectives, see Pachler et al. (2010), Kukulska-Hulme & Traxler (2020) and Hug (2021a).

As far as the design and development options in the educational system are concerned, there is a demand for educational research which does not remain fixated on German interpretive patterns and European zones of affluence, and which has a blind spot regarding neither media and mediality nor medial forms and digital technologies. Its research results can substantially contribute to a better understanding of the paradoxical constellations of (dis)comfort in the educational cultures of digitality, as well as to addressing successfully the best ways of dealing with them.

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References

Adolf, M. T. (2014). Involuntaristische Mediatisierung. Big Data als Herausforderung einer informationalisierten Gesellschaft. In H. Ortner, D. Pfurtscheller, M. Rizzolli, & A. Wiesinger (Eds.), *Datenflut und Informationskanäle* (pp. 19-35). Innsbruck: Innsbruck University Press.

Altenrath, M., Helbig, C., & Hofhues, S. (2020). Deutungshoheiten: Digitalisierung und Bildung in Programmatiken und Förderrichtlinien Deutschlands und der EU. *Zeitschrift MedienPädagogik*, 17 (Jahrbuch Medienpädagogik), 565–594. doi:10.21240/mpaed/jb17/2020.05.22.X.

Beetham, H., & Sharpe, R. (Eds.). (2020). *Rethinking Pedagogy for a Digital Age* (3rd ed.). New York: Routledge. doi:10.4324/9781351252805.

Biesta, G. (2010). *Good education in an age of measurement: Ethics, politics, democracy.* New York: Routledge.

Biesta, G. (2011). Disciplines and theory in the academic study of education: A comparative analysis of the Anglo-American and Continental construction of the field. *Pedagogy, Culture & Society*, *19*(2), 175–192. doi: 10.1080/14681366.2011.582255.

Binder, U., & Drerup, J. (Eds.). (2020). *Der Preis der Bildung. Dimensionen der Wertbestimmung schulischen Wissens*. Bielefeld: transcript.

Bishop, R., Gansing, K., Parikka, J., & Wilk, E. (Eds.). (2017). *Across & beyond: A transmediale reader on post-digital practices, concepts, and institutions*. Berlin: Sternberg Press.

Blühdorn, I., with Butzlaff, F., Deflorian, M., Hausknost, D., & Mock, M. (2020). *Nachhaltige Nicht-Nachhaltigkeit. Warum die ökologische Transformation der Gesellschaft nicht stattfindet*. Bielefeld: transcript.

BMBWF (2018). Masterplan Digitalisierung. Retrieved from https://www.bmbwf.gv.at/Ministerium/Presse/Masterplan-Digitalisierung.html [12 March 2021].

Boeckmann, K., Hipfl, B., & Stotz, G. (1992). Studien zur Medienmündigkeit. *Österreichische Hochschulzeitung*, *44*(5), 5–6.

Bollenbeck, G. (1996). *Bildung und Kultur. Glanz und Elend eines deutschen Deutungsmusters*. Frankfurt am Main: Suhrkamp.

Cizek, K., Uricchio, W., Anderson, J., Agui Carter, M., Harris, T.A., Holmes, M., & Stephenson, M. (2019). *Collective Wisdom* – Part 1: 'We Are Here': Starting Points in Co-Creation. Retrieved from https://wip.mitpress.mit.edu/pub/collective-wisdom-part-1 [12 March 2021].

Common, M. S., & Stagl, S. (2007). *Ecological Economics: An Introduction*. Cambridge: Cambridge University Press.

Cramer, F. (2015). What is 'post-digital'? In D. M. Berry & M. Dieter (Eds.), *Postdigital Aesthetics: Art, Computation and Design* (pp. 12–26). New York, NY: Palgrave Macmillan.

Dander, V. (2020). Sechs Thesen zum Verhältnis von Bildung, Digitalisierung und Digitalisierung. In V. Dander, P. Bettinger, E. Ferraro, E. Leineweber, & K. Rummler (Eds.), *Digitalisierung – Subjekt – Bildung. Kritische Betrachtungen der digitalen Transformation* (pp. 19–37). Opladen/Berlin/Toronto: Barbara Budrich. Retrieved from https://library.oapen.org/bitstream/handle/20.500.12657/46161/9783847415480.pdf?sequence=1&isAllowe d=y.

Ennals, R. (2016). Artificial stupidity. *AI & Society*, *31*(3), 431–432. doi:10.1007/s00146-016-0655-6.

European Commission (2020a). Proposal for a Regulation of the European Parliament and of the Council on European data governance (Data Governance Act). Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52020PC0767 [12 March 2021].

European Commission (2020b). Digital Education Action Plan 2021-2027. Resetting Education and Training for the Digital Age. Retrieved from https://ec.europa.eu/education/sites/default/files/document-library-docs/deap-communication-sept2020_en.pdf [12 March 2021].

Falk, M. (2021). Artificial stupidity. *Interdisciplinary Science Reviews*, *46*(1–2), 36–52.

Faßler, M. (2011). Co-Evolutionary Anthropology of the Medial /CAM. In G. Russegger, M. Tarasiewicz, & M. Wlodkowski (Eds.), *Coded Cultures. New Creative Practices out of Diversity* (pp. 70–98). Vienna/New York: Springer.

Freud, S. (1997 [1930]). Das Unbehagen in der Kultur. In S. Freud, Studienausgabe, Vol. IX. *Fragen der Gesellschaft, Ursprünge der Religion* (pp. 191–270). Ed. A. Mitscherlich, A. Richard, & J. Strachey. Frankfurt am Main: Fischer.

Frey, G. (1967). *Die Mathematisierung unserer Welt*. Stuttgart: Kohlhammer.

Friesen, N. (2019). Educational Research in America Today: Relentless Instrumentalism and Scholarly Backlash. *Erziehungswissenschaft*, *59*(30), pp. 77–83. doi:10.3224/ezw.v30i2.09.

Haugeland, J. (1985). *Artificial Intelligence: The Very Idea*. Cambridge, Mass.: MIT Press.

Haugsbakk, G. (2020). Special issue: 30 years of ICT and learning in education – major changes and challenges. *Seminar.Net*, 16(2). doi:10.7577/seminar.4043.

Haugsbakk, G., & Nordkvelle, Y. (2007). The Rhetoric of ICT and the New Language of Learning: A critical analysis of the use of ICT in the curricular field. *European Educational Research Journal*, *6*(1), doi: 10.2304/eerj.2007.6.1.1.

Hayles, N. K. (2002). *Writing machines*. Cambridge, Mass.: MIT Press.

Heydorn, H.-J. (1980). Zum Verhältnis von Bildung und Politik. In H.-J. Heydorn, *Ungleichheit für alle. Zur Neufassung des Bildungsbegriffs* (pp. 7–62). Bildungstheoretische Schriften Vol. 3. Frankfurt am Main: Syndikat.

Hierdeis, H. (2010). Das Unbehagen in der Bildungskultur. In D. Korczak (Ed.), *Spurensuche. Kulturwissenschaftliche Interpretationen und gesellschaftliche Rezeption* (pp. 171–189). Kröning: Asanger.

Hug, T., Friesen, N., & Rourke, L. (2007). Nutzenerwartungen und Wissenswandel – Kritische Betrachtungen im Spannungsfeld von nutzloser Nützlichkeit und nützlicher Nutzlosigkeit am Beispiel der Learning Sciences. In G. Reinmann, & J. Kahlert (Eds.), *Der Nutzen wird vertagt … Bildungswissenschaften im Spannungsfeld zwischen wissenschaftlicher Profilbildung und praktischem Mehrwert* (pp. 173–197). Lengerich: Pabst-Verlag.

Hug, T. (2021a). Sound Pedagogy Practices for Designing and Implementing Microlearning Objects. In: J. R. Corbeil, B. H. Khan & M. E. Corbeil (Eds.), *Microlearning in the Digital Age. The Design and Delivery of Learning in Snippets* (pp. 35–57). New York: Routledge.

Hug, T. (2021b). Thesen zum (Un)Behagen in Bildungskulturen der Digitalität. In H. Hierdeis (Ed.), Digitalisierung und Gemeinwohl (pp. 149–171). Kröning: Asanger.

Kabaum, M., & Anders, P. (2020). Warum die Digitalisierung an der Schule vorbeigeht. Begründungen für den Einsatz von Technik im Unterricht in historischer Perspektive. *Zeitschrift für Pädagogik*, *66*(3), 309–323.

Kemethofer, D., Reitinger, J., & Soukup-Altrichter, K. (Eds.). (2021). *Vermessen? Zum Verhältnis von Bildungsforschung, Bildungspolitik und Bildungspraxis*. Münster: Waxmann.

Kovas, Y., Malykh, S., & Gaysina, D. (Eds.). (2016). *Behavioural Genetics for Education*. London: Palgrave Macmillan.

Krippendorff, K. (2011). Principles of Design and a Trajectory of Artificiality. *Journal of Product Innovation Management, 28*(3), 411–418. Retrieved from https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1540-5885.2011.00814.x.

Kukulska-Hulme, A. & Traxler, J. (2020). Design principles for learning with mobile devices. In H. Beetham & R. Sharpe (Eds.). (2020). *Rethinking Pedagogy for a Digital Age* (pp. 181–196) (3rd ed.). New York: Routledge. https://doi.org/10.4324/9781351252805.

Kulikov, S. B., & Shirokova, A. V. (2021). Artificial intelligence, culture and education. *AI & Society*, *36*, 305–318. doi:10.1007/s00146-020-01026-7.

Kultusministerkonferenz (Ed.). (2016). *Bildung in der digitalen Welt. Strategie der Kultusministerkonferenz*. Berlin. Retrieved from https://www.kmk.org/fileadmin/pdf/PresseUndAktuelles/2018/Digitalstrategie_2017_mit_Weiterbildung.pdf [12 March 2021].

Lee, E. A. (2019). *The Coevolution. The Entwined Futures of Humans and Machines*. Cambridge, Mass.: MIT Press.

Leineweber, C., & Wunder, M. (2021). Zum optimierenden Geist der digitalen Bildung. Bemerkungen zu adaptiven Lernsystemen als sozio-technische Gefüge. *MedienPädagogik*, *42*, 22–46. doi:10.21240/mpaed/42/2021.03.08.X.

Lepuschitz, W., Merdan, M., Koppensteiner, G., Balogh, R., & Obdržálek, D. (Eds.). (2021). *Robotics in Education. Methodologies and Technologies*. Cham: Springer.

Leschke, R. (2018). "Subjektlose Verantwortung" – Zur Ethik autonomer Systeme. In T. Hug, & G. Pallaver (Eds.), *Talk with the Bots – Gesprächsroboter und Social Bots im Diskurs* (pp. 87–101). Innsbruck: iup.

Lith, U. v. (1985). *Der Markt als Ordnungsprinzip des Bildungsbereichs: Verfügungsrechte, ökonomische Effizienz und die Finanzierung schulischer und akademischer Bildung*. München: Oldenbourg.

Löffler, D. (2019). *Generative Realitäten I. Die Technologische Zivilisation als neue Achsenzeit und Zivilisationsstufe. Eine Anthropologie des 21. Jahrhunderts*. Weilerswist: Velbrück.

Luhmann, N., & Schorr, K. E. (1982). Das Technologiedefizit der Erziehung und die Pädagogik. In N. Luhmann, & K. E. Schorr (Eds.), *Zwischen Technologie und Selbstreferenz. Fragen an die Pädagogik* (pp. 11–41). Frankfurt am Main: Suhrkamp.

Mansell, R. (2018). *Transformative Communication Technologies: The Accountability Challenge*. 36th Boehm-Bawerk Lecture – Inauguration of the Department of Media, Society and Communication. Kleine Medienreihe (Vol. 2). Innsbruck: iup.

Mersch, D. (2019). Kreativität und Künstliche Intelligenz. Einige Bemerkungen zu einer Kritik algorithmischer Rationalität. *Zeitschrift für Medienwissenschaft*. Issue 21: Künstliche Intelligenzen, *11*(2), 65–74. doi:10.25969/mediarep/12634.

Missomelius, P. (2021). *Bildung – Medien – Mensch. Mündigkeit im Digitalen*. Göttingen: Vandenhoeck & Ruprecht (forthcoming).

Morozov, E. (2014). *To save everything, click here: Zechnology, solutionism and the urge to fix problems that don't exist*. London: Penguin Books.

Müller, K. E. (2003). Unbehagen mit der Kultur. In K. E. Müller (Ed.), *Phänomen Kultur. Perspektiven und Aufgaben der Kulturwissenschaften* (pp. 13–48). Bielefeld: transcript.

Münch, R. (2018). *Der bildungsindustrielle Komplex. Schule und Unterricht im Wettbewerbsstaat*. Weinheim: Beltz Juventa.

Nachtwey, O., & Seidl, T. (2017). Die Ethik der Solution und der Geist des digitalen Kapitalismus. IfS Working Papers no. 11 [Institut für Sozialforschung an der Johann Wolfgang Goethe-Universität]. Retrieved from http://www.ifs.uni-frankfurt.de/wp-content/uploads/IfS-WP-11.pdf [12 March 2021]

Nida-Rümelin, J., & Weidenfeld, N. (2018). *Digitaler Humanismus. Eine Ethik für das Zeitalter der Künstlichen Intelligenz*. München: Piper.

Niesyto, H. (2021). ‚Digitale Bildung' wird zu einer Einflugschneise für die IT-Wirtschaft. Retrieved from https://horst-niesyto.de/wp-content/uploads/2021/02/2021_Niesyto_digitale_Bildung_IT-Wirtschaft_Langfassung.pdf [12 March 2021].

Pachler, N., Bachmair, B., & Cook, J. (2010). *Mobile Learning: Structures, Agency, Practices*. New York: Springer.

Pfadenhauer, M. (2018). Artificial Companions. In A. Kalina et al. (Eds.), *Mediatisierte Gesellschaften: Medienkommunikation und Sozialwelten im Wandel* (pp. 55–70). Baden-Baden: Nomos.

Picciano, A. G. (1994). Technology and the Evolving Educational-Industrial Complex. *Computers in the Schools*, *11*(2), 85–102.

Pietsch, W., Wernecke, J., & Ott, M. (Eds.). (2017). *Berechenbarkeit der Welt? Philosophie und Wissenschaft im Zeitalter von Big Data*. Wiesbaden: Springer VS.

Radtke, F.-O. (2009). Ökonomisierung. In S. Andresen et al. (Eds.), *Handwörterbuch Erziehungswissenschaft* (pp. 621–636). Weinheim: Beltz.

Reheis, F. (2004). Käufliche Bildung. Zur Problematik der Kommerzialisierung im Bildungsbereich. *ZEP – Zeitschrift für internationale Bildungsforschung und Entwicklungspädagogik*, *27*(3), 9–13. URN:urn:nbn:de:0111-opus-92599.

Reichenbach, R. (2016). Über Neomanie und die posttheoretische Phase in der Erziehungswissenschaft. In S. Blömeke, M. Caruso, S. Reh, U. Salaschek, & J. Stiller (Eds.), *Traditionen und Zukünfte. Beiträge zum 24. Kongress der Deutschen Gesellschaft für Erziehungswissenschaft* (pp. 17–28). Opladen: Budrich.

Schmidt, S. J. (2006). „Zwischen Fundamentalismus und Beliebigkeit." Gesprächsnotizen. Passages from a conversation between Thomas Feuerstein and Siegfried J. Schmidt from October 2005. First printed in K. Thoman (Ed.), (2006), *Thomas Feuerstein. Outcast of the Universe* (pp. 221–226). Vienna: Schleebrügge. Also available online at http://www.myzel.net/Narration/schmidt.html [9 March 2021].

Schmidt, S. J. (2015). (Un)Behagen an der Kultur. In I. Schneider, & M. Sexl (Eds.), *Das Unbehagen an der Kultur* (pp. 17–37). Hamburg: Argument.

Schneider, H. J. (1992). *Phantasie und Kalkül: Über die Polarität von Handlung und Struktur in der Sprache*. Frankfurt am Main: Suhrkamp.

Schneider, I., & Sexl, M. (Eds.). (2015). *Das Unbehagen an der Kultur*. Hamburg: Argument.

Selwyn, N. (2015). Minding our language: Why education and technology is full of Bullshit … and what might be done about it. *Learning, Media and Technology*, *41*(3), 437–443. doi:10.1080/17439884.2015.1012523.

Selwyn, N. (2019). *Should Robots Replace Teachers? AI and the Future of Education*. Cambridge/UK: Polity Press.

Siljander, K., Kivelä, A., & Sutinen, A. (Eds.). (2012). *Theories of* Bildung *and Growth: Connections and Controversies Between Continental Educational Thinking and American Pragmatism*. Rotterdam: BRILL.

Simanowski, R. (2018). *Stumme Medien. Vom Verschwinden der Computer in Bildung und Gesellschaft*. Berlin: Matthes & Seitz.

Stalder, F. (2016). *Kultur der Digitalität*. Frankfurt am Main: Suhrkamp.

Stocchetti, M. (Ed.). (2020). *The Digital Age and Its Discontents. Critical Reflections in Education*. Helsinki: Helsinki University Press.

Turkle, S. (2021). *The Empathy Diaries: A Memoir*. New York: Penguin Press.

United Nations (Ed.). (2021). General comment No. 25 (2021) on children's rights in relation to the digital environment. Retrieved from https://www.ohchr.org/EN/HRBodies/CRC/Pages/GCChildrensRightsRelationDigitalEnvironment.aspx [accessed 29 March 2021].

Veith, H. (2003). Lernkultur, Kompetenz, Kompetenzentwicklung und Selbstorganisation. Begriffshistorische Untersuchungen zur gesellschaftlichen und pädagogischen Konstruktion von Erziehungswirklichkeiten in Theorie und Praxis. In Arbeitsgemeinschaft Betriebliche Weiterbildungsforschung e.V./Projekt Qualifikations-Entwicklungs-Management (Ed.), *Was kann ich wissen? Theorie und Geschichte von Lernkultur und Kompetenzentwicklung* (pp. 179–229). (= QUEM-report, Schriften zur beruflichen Weiterbildung, Issue 82). Berlin. Retrieved from http://www.abwf.de/content/main/publik/report/2003/Report-82.pdf [accessed 9 March 2021].

Verger, A., Lubienski, C., & Steiner-Khamsi, G. (Eds.). (2016). *World Yearbook of Education 2016: The Global Education Industry*. New York/Abingdon: Routledge.

van den Boomen, M. (2014). *Transcoding the Digital: How Metaphors Matter in New Media. Amsterdam: Institute of Network Cultures*. Available online at http://networkcultures.org/wp-content/uploads/2014/02/TOD14-binnenwerk-def-PDF.pdf [accessed 9 March 2021].

Weich, A. (2019). Das ‚Frankfurt-Dreieck.' *Medienimpulse*, *57*(2). doi: 10.25365/mi-02-19-05.

Werthner, H. et al. (2019). Wiener Manifest für Digitalen Humanismus. Retrieved from https://dighum.ec.tuwien.ac.at/wp-content/uploads/2019/07/Vienna_Manifesto_on_Digital_Humanism_DE.pdf.

Wiersing, E. (Ed.). (2001). *Humanismus und Menschenbildung: Zu Geschichte, Gegenwart und Zukunft der bildenden Begegnung der Europäer mit der Kultur der Griechen und Römer*. Essen: Die Blaue Eule.

Williamson, B., & Hogan, A. (2020). *Commercialisation and privatisation in/of education in the context of Covid-19*. Brussels: Education International. Retrieved from https://issuu.com/educationinternational/docs/2020_eiresearch_gr_commercialisation_privatisation?fr=sZDJkYjE1ODA2MTQ [accessed 15 August 2020].

Wittig, F. (1997). *Maschinenmenschen. Zur Geschichte eines literarischen Motivs im Kontext von Philosophie, Naturwissenschaft und Technik*. Würzburg: Königshausen & Neumann.

Wolf, E., & Thiersch, S. (2021). Optimierungsparadoxien. Theoretische und empirische Beobachtungen digital mediatisierter Unterrichtsinteraktionen. *MedienPädagogik*, *42*, 1-21. doi:10.21240/mpaed/42/2021.03.07.X.

Five Theses on (Dis)Comfort in the Educational Cultures of Digitality

Theo Hug

Tezy o (dys)komforcie w edukacyjnych kulturach cyfryzacji

S t r e s z c z e n i e

Digitalizacja funkcjonuje w wielu aktualnych dyskusjach jako migotliwa formuła przewodnia nie tylko dla procesów transformacji technologicznej, społecznej i kulturowej w ogóle, ale także dla aktualnych problemów reprodukcji społecznej i przewrotów w sektorze edukacji w szczególności. Z jednej strony, w kulturach edukacyjnych panuje powszechny niepokój związany z cyfrowością; z drugiej strony, obietnice technologii uczenia się przyszłości również promują tendencje do komfortu dla niektórych grup. Opierając się na szerszej perspektywie, która wykracza poza freudowskie rozumienie dyskomfortu w kulturze, niniejszy artykuł stawia pięć tez do dyskusji, z których wszystkie wyznaczają linie błędu (dys)komfortu w edukacyjnych kulturach cyfrowości.

S ł o w a   k l u c z o w e: kultura edukacyjna, cyfryzacja, technologiczny solicyzm, retoryka cyfryzacji, uczenie maszynowe, robotyka

Тео Хуг

Тезисы о (дис)комфорте
в образовательных культурах цифровизации

А н н о т а ц и я

Во многих современных дискуссиях цифровизация выступает в качестве мерцающей направляющей формулы не только для процессов технологической, социальной и культурной трансформации в целом, но и для актуальных проблем социального воспроизводства и потрясений в образовании в частности. С одной стороны, страх перед цифровизацией широко распространен в образовательных культурах; с другой стороны, обещания будущего в области технологий обучения также способствуют успокаивающим тенденциям среди некоторых групп. Начиная с более широкой перспективы, выходящей за рамки фрейдистского понимания дискомфорта в культуре, статья представляет пять тезисов для обсуждения, каждый из которых обозначает линии разлома (дис)комфорта в образовательных культурах цифровизации.

К л ю ч е в ы е   с л о в а: образовательная культура, цифровизация, технологическое решение, риторика цифровизации, машинное обучение, робототехника

Theo Hug

Tesis sobre la (in)comodidad en las culturas educativas de la digitalidad

R e s u m e n

En muchos de los debates actuales, la digitalización funciona como una brillante fórmula orientadora no sólo de los procesos de transformación tecnológica, social y cultural en general, sino también de los actuales problemas de reproducción social y de las convulsiones del sector educativo en particular. Por un lado, existe un malestar generalizado en las culturas educativas de la digitalidad; por otro lado, las promesas tecnológicas de aprendizaje del futuro también promueven tendencias de comodidad para algunos grupos. Partiendo de una perspectiva más amplia que va más allá de la comprensión freudiana del malestar en la cultura, este artículo propone cinco tesis puntuales para el debate, todas las cuales marcan líneas de (des)confort en las culturas educativas de la digitalidad.

P a l a b r a s   c l a v e: cultura educativa, digitalización, solucionismo tecnológico, retórica de la digitalización, aprendizaje automático, robótica